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TEXTILE WORLD RECORD

FEB 16 1910

A Journal for Manufacturers and All Interested in the Processes and Products of Textile Manufacturing

LORD & NAGLE COMPANY, BOSTON, MASS.

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Mercerizing Machinery for Piece Goods

—— AND ——

Yarns in the Warp or Chain

All Kinds of Outfits for Bleaching Thread and Soft Twisted Yarns.
Bleaching Machinery for Yarns in the Warp or Chain.

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Estimates, Drawings and full particulars of complete plants furnished on application

THE TEXTILE-FINISHING MACHINERY CO.

Howard Building, Providence, R. I.

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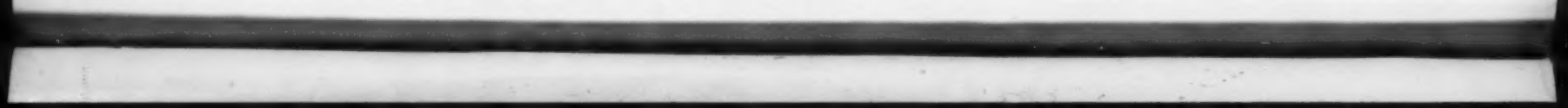

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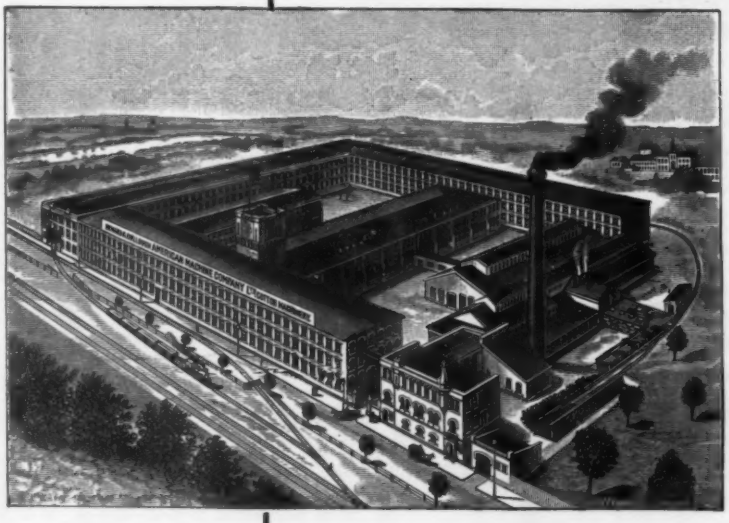

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TEXTILE WORLD RECORD

COMBINING

The Textile World and Textile Record.

VOL. 38 (NEW SERIES.) February, 1910 No. 5

Monthly Comment.

Industrial Peace.

The suffering and waste of material resources caused by the resort to strikes and lockouts for the settlement of disputes between employer and employe demonstrates the desirability of a better way and make argument on this point superfluous. The search for this better way has been carried on in all parts of the world, and to Canada belongs the credit for having developed and put into practice a plan that has given results far in advance of those thus far obtained by other methods. This method of investigation and settling labor troubles was in great measure the work of W. L. Mackenzie King, at the present time Minister of Labor in the Canadian Government. The event which led to the framing of the law was a strike of the miners at Lethbridge in 1906, and the conditions which forced a settlement are described in the following open letter to Sir Wilfred Laurier, the letter itself having served to arouse both operators and strikers to the gravity of the crisis caused by their failure to settle their differences:

Local Improvement District of Ramsay.
Bladworth, Sask., Nov. 19, 1906.

Dear Sir Wilfrid: The hamlet of Bladworth is the supplying point for settlers in approximately twelve townships surrounding.

These townships have approximately fifty settlers each settled therein. The country is open rolling prairie, devoid of trees. The settlers depend for fuel on wood and coal obtained at the nearest railway station, Bladworth. The local dealers secure their wood from the Prince Albert country, and their coal from the Galt Mines, Lethbridge. No coal has been obtained from this latter source since April last. One car was obtained from Banff in September last, since which no coal has been received here. Ten cars are under orders from Lethbridge, and none delivered. One car is ordered from Estevan and promised by the mine operator for December 17 next.

Wood has been ordered from the Cowan Company, Prince Albert, and their answer is:

"We have neither slabs, edgings, nor cuttings, and though we have inquired we are unable to purchase any cordwood—there is none in the city."

Settlers have been burning lumber at $30 a thousand, willow bramble, twisted hay and grain. These sources are well-nigh exhausted.

Dr. J. Fyfe reports from observation that no fuel is in the settlers' hands, and that suffering and perhaps death will ensue therefrom. All public schools are closed for want of fuel. The Saskatchewan Hotel, a thirty-roomed house, has but one fire.

A blizzard has been blowing on November 15, 16 and 17, with zero weather. I leave you, sir, to imagine what the condition of your fellow-subjects is in the electoral district of Batoche—a name not unknown in history. This condition is not local, but general.

We are informed that those persons operating the mines of the people are disputing over their rights—regardless of the right of the people to live.

I would respectfully ask that you, sir, put an end to a dispute that is intolerable, and the maintenance of which endangers the life and happiness (inalienable rights of all free people) of all settlers.

I ask, you, sir, on behalf of a suffering people, that by the powers vested in you the right of eminent domain be exercised.

I can assure you, sir, without exaggeration, that

this matter is one of life and death to the settlers here, one requiring immediate action.

Your obedient humble servant,
Wm. L. Ramsay,
Chairman of Committee.

To the Right Hon. Sir Wilfrid Laurier,
Premier of Canada, Ottawa, Ont.

It was that letter which enabled Mr. King to bring the operators and miners to an agreement, and it was the conditions described in the letter which led to the resolve by the people of Canada that a repetition of such conditions should be made impossible.

The Canadian method which was subsequently adopted is not voluntary arbitration. It is not compulsory arbitration. It is compulsory investigation before the strike or lockout under conditions favorable for sifting out the truth. After that investigation has been made and a finding published, both parties, employer and employed, are left free to resort to the lockout on the one hand or the strike on the other. When a dispute arises each side chooses an investigator. The two so chosen choose a third, or, in case of a failure to agree, the third one is appointed by the Government. The board so chosen has authority to send for persons and papers, to put witnesses under oath and punish them for contempt. If a settlement of the dispute is not arranged, the board makes a report, or in case of a failure to agree, separate reports. These are published and then the dispute is left with the employers and employes to be settled by a resort to a strike or lockout if they do decide. In practice a settlement has nearly always been reached. Out of 80 disputes referred to investigating boards in Canada during the first two years and nine months the law has been in force, 74 settlements have been reached. Assuming that under the old system strikes or lockouts would have lasted as long as has been the case on the average previous to the law, these 74 settlements represent a saving in wages alone of over $3,500,000 in less than three years, with a prevention of suffering and death which cannot be estimated. Over $15,000,000 in wages had been lost in Canada through strikes in the ten years preceding the enactment of this act. The reasons for the success of the Canadian law are stated as follows by one who has served as an investigator under it:

> My own opinion is that the law as it stands is very useful in providing intermediaries who have authority to intervene between the contestants, ascertain with some accuracy the points in dispute and the merits of each case, and promote an amicable settlement between them. Much depends upon the tact and skill, fairness and open-mindedness of the members of the board and especially of the third man. In practice we have found that a very large percentage of the cases have been settled in this way. Where the parties are irreconcilable and a report has to be made, it becomes more difficult; but even here the strike has been postponed until the parties have cooled down a bit, and we have found that if one side is prepared to accept the report and the other side is not, but strikes or locks out in the face of it, public opinion is against the side so acting and is a force likely to bring them to time.

The Canadian law is so reasonable, it has given such satisfactory results in practice, that a movement has been started to secure the adoption of a similar act in the United States. Two bills have been introduced in the Massachusetts Legislature, one accompanying a petition signed by President Charles W. Eliot, George B. Hugo, and George H. Ellis, the other drawn by ex-Representative Robert Luce, each embodying the principle of the Canadian statute. The Eliot bill deals only with investigation, creates a Commissioner of Labor to enforce it, and would doubtless be followed by the abolition of the State Board of Conciliation and Arbitration. The Luce bill changes that Board into a State Board of Labor, and preserves its powers of arbitration.

The effort to secure the adoption in this country of the Canadian plan of settling industrial disputes deserves the support of employers, employes and the general public. It is fair to all. It is much better for us to profit by Canadian experience than to blunder along with the present wasteful method of settling disputes by the argument of superior force until some Lethbridge horror on this side of the line forces the American people to profit by their own experience.

The Supply of Cotton.

The Textile World Record points the moral of the situation with the suggestion that Lancashire should direct its energy and capital to raising more cotton in the Southern States. "American cotton," it is said, "like colonial cotton, belongs to the buyer who pays the most for it," and "American cotton can be carried to Liverpool for less than it can be carried to Fall River." This is very well, and we may expect that American capital and labor will be attracted by the high profits of cotton growing. The experience of Lancashire men who proposed to grow cotton in the States was not encouraging, however.—The Manchester (Eng.) Guardian.

There is no need to attract capital to the cotton fields of the South. The increase in the proceeds from the sale of cotton to foreign countries would alone supply the capital required in the improbable contingency of outside capital being required. The need of the South is more labor for increasing the cotton crop. Without labor all the capital of the world would not produce a pound of cotton. The question then is, where and how this additional labor can be obtained. Not from other parts of the United States, for there is no surplus labor supply in this country. Not from Asia, for no fact is better established than that the influx of the unassimilative Asiatics into the South would be an evil immeasurably greater than a cotton famine. It is from Europe only that the necessary supply of labor which will assimilate with the white population of the South, must come. Europe is now supplying this country with a million or more people a year, but the difficulty is that they do not go to the South. The most of them seek the already overcrowded towns and cities of the North, where they soon join in the general outcry against the high cost of living, blaming the farmer, the manufacturer, the middleman, the gold supply, the tariff, blaming everybody and everything except themselves for the burdens they are forced to bear. The remedy for the short supply of American cotton is in the hands of the Europeans. Let them divert the stream of European emigration to the American cotton belt. That is the only remedy for the industrial paralysis by which millions of cotton spindles are idle because of a lack of raw material which could be produced in abundance from vast tracts of fertile land that are now untilled.

The "Guardian" speaks of "the experiences of Lancashire men who proposed to grow cotton in the States." The men of Lancashire have had no "experiences" in this direction that warrant a conclusion as to this important question. As the "Guardian" evidently had in mind the visits of various Lancashire delegations to the American cotton belt in recent years, it will not be out of place to recall some of those experiences. For example, a party of five Lancashiremen, with a secretary, none of whom had any practical experience in cotton growing, landed at Boston at 8.30 a. m., on Mar. 29, 1906, and on April 3 at 7 a. m., they entered the American cotton belt. Here is their own summary of their journey:

> Our observations were to be made throughout a territory stretching 500 miles from north to south, and 1,500 miles from east to west—a cotton-producing region of 750,000 square miles, or 480,000,000 acres. . . . During the five and a half weeks we were ashore we traveled 7,066 miles, and interviewed numerous agricultural professors, farmers, planters, ginners, compressors, factors, brokers, speculators, carriers by rail and sea, proprietors of cotton-seed oil mills, cotton spinners and manufacturers, engineers, machinists and government officers.

This bird's-eye view was at the rate of 41,666 square miles, an area nearly as large as England, for each day of the party's stay in the cotton belt. In the following year, 1907, came the Atlanta Cotton Conference, with the visit of more than one hundred representatives of the European cotton trade to this country and their 5,000-mile trip through the cotton belt. During this journey a few of the party spent a day or two in examining the Crawford plantation at Heathman, Miss., for the purchase of which an option had been secured. This visit and journey through the cotton belt by the Europeans in 1907 was highly profitable in many ways, but no one, least of all one who accompanied the party, would seriously claim that the excursion afforded any measurable opportunity for acquiring practical experience in the growing of cotton.

Early in 1908 the backers of the 1906 in-

vestigation issued a circular to the Lancashire trade inviting subscriptions to the stock of a limited company which was to purchase the Crawford plantation for the raising of cotton. This circular contained no hint of discouraging experiences. On the contrary its optimistic tone is indicated by this passage:

> It is fully believed that the investment would realize a 10 per cent. return, but it is of greater importance to demonstrate practically and with as little delay as possible what can be achieved with the improvement suggested at the Vienna International Cotton Congress and the Atlanta Conference of Cotton Growers, Spinners and Manufacturers.

In commenting on this circular in our February, 1908, issue we pointed out a defect in the proposed enterprise and suggested its correction in these words:

> Reference is made in the English spinners' circular to one feature of the plan that deserves more consideration than the promoters may have given to it. They state "it is desirable that, should a limited company be formed, intended holdings by companies or firms should be comparatively small." We venture to suggest that if a limited company (corporation) is formed by Lancashire spinners to engage in cotton growing in America it is very desirable that such company should be an American corporation, organized under the laws of some of the States.
>
> It is surely not necessary to dwell on the obvious advantages of an American corporation and on the objections to a British or other foreign corporation for growing cotton in the United States. Opposition to the control of American cotton fields by foreign corporations has already been stated by men prominent in the South. Such opposition, which we are far from considering unwarranted, can be disarmed by the Lancashire spinners by forming their corporation under the laws of this country. In any event it will be subjected to the control of our laws. A word to the wise is sufficient. The commendable disposition shown by the English spinners to develop cotton growing along the lines of least resistance strengthens our hope that they will follow the same lines in forming their limited company.

Three months later the announcement was made that the enterprise had been definitely abandoned. In the long statement by Thomas Coates, which accompanied the announcement, there was no reference to discouraging experiences of those who had furthered the scheme. The plan to promote cotton growing in the American cotton belt, which had engaged the attention of the Lancashire trade for over two years, which had been the object of three visits of investigation to America by Lancashire delegations and which promised to lead to a great and sorely needed increase in the world's cotton crop, this plan was abandoned on the advice of an English lawyer, who "generously offered to forego all charges except some sums, £5, 10s, accountant's charges, and £7, 15s, for printing." And the reason for this advice was the fear of American opposition to an English cotton growing company in the South, an objection which we had raised months before, and for which we had suggested the obvious alternative. Here are Mr. Coates' words in which he announced the abandonment of the plan:

> During their discussion on the matter it was stated that not only the firm in America, but every director also, would be responsible to the extent of the whole of his estate in the case of legal proceedings. Under the circumstances they did not think it advisable to go into the scheme. Another proposal was to form a company in England, with a subsidiary company in America, and although they were disposed to go into cotton growing in America, the unanimous opinion was that they had better abandon the scheme.

Such are the facts about the Lancashire plan to increase the American cotton crop. It was conceived, carried on and abandoned by a few men who had a total misconception of the condition essential to success. The South does not need capital with which to increase the cotton crop. Putting the resources of the Bank of England back of the Heathman plantation would not add a pound to the cotton crop unless additional labor was obtained with which to till the soil and gather the cotton. We encouraged the purchase of an experimental plantation by the Lancashire spinners in the hope that it would lead to their becoming acquainted with the real needs of the South and to their diverting European emigration to that section of the country. We have not yet abandoned hope that people as intelligent, practical, enterprising, shrewd, persistent and in as great need of cotton as are the people of Lancashire, will sooner or later look at facts in their proper proportions and act accordingly.

Wool Goods.

A peculiar situation prevails in the wool goods market. The high prices for worsted goods, in part the result of the increased cost of wool, have encountered an impassable barrier in the general refusal of the clothing trade to buy at the advance. The result is idle looms at a time of general prosperity which would naturally bring with it a steady and general demand for wool fabrics.

This interruption of trade is the more serious because, coming suddenly, it finds both spinning and weaving mills loaded down with high priced raw material bought in anticipation of the boom that was heralded from high and low places but a few months ago. The scale on which the wool trade has anticipated future requirements is shown by the imports of wool, which for the year 1909 amounted to 312,131,171 pounds, as compared with 142,559,384 pounds for the twelve months of 1908. It is idle to attempt to predict the final outcome of this struggle in the wool goods market. That must be left for time to decide. One feature, however, deserves special attention, and that is the suddenness with which the deadlock has been precipitated. Salesmen who loaded themselves with worsted samples and started on long Western trips encountered all along the line a monotonous and discouraging refusal by the clothiers to buy worsteds. Whatever may have been the underlying cause for this change of base and for the abruptness with which it was made, it has created a most difficult position for both the manufacturers and the distributers of the goods.

These experiences in the wool and wool goods trade during recent months has illustrated in a striking manner the interrelation and interdependence of all branches of the business, and how a change of sentiment among buyers of goods can suddenly upset plans which the manufacturing branch of the industry has developed on the most extensive scale, as regards both the constructions and operation of mills.

This turning from worsteds has been accompanied by an equally sudden and unexpected return of carded woolen goods to favor. And this has likewise caused a disarrangement in the plans of the carded woolen mills. Accustomed as they have been for years to a draggy, discouraging market, the sudden influx of orders found them short of raw material and of machinery with which to make the goods. Thus during recent months the wool market has presented the unusual spectacle of buyers recruited almost wholly from the ranks of the carded woolen manufacturers.

Although the carded woolen mills have been favored by a general demand for their product, they have encountered obstacles different in character, but no less serious than those found in the worsted trade. The difficulties with the carded woolen trade have been a scarcity of the right kinds of raw material and an insistent demand for goods at low prices. The result has been an adulteration of fabrics hitherto unknown, in which every consideration has been sacrificed to those of cheapness. A comparatively small number of carded woolen mills have kept their products at a high standard, but the great majority have naturally yielded to a situation in which high grade raw material was scarce and expensive on the one hand, while the demand for low priced goods was overwhelming on the other.

The evidence of this two-fold difficulty is supplied by the fabrics now being offered. As we write we have before us a collection of carded woolen overcoatings and heavy weight suitings from various lines recently placed on the market. One is a 21-ounce overcoating sold at 75 cents net and bearing the words, "These Goods are All Wool." A yard of this fabric would require two pounds of stock at the picker. As the cloth is made of 1 run yarn with 20 picks, the cost of manufacturing may be placed at 30 cents a yard. The goods will net the manufacturer about 65 cents. That leaves 35 cents to provide two pounds of raw material and a profit. We will leave the profit out of consideration, and assume the manufacturer is running his mill in order to get a new dollar for an old one. An idea of the kind of material he must use

to accomplish that result can be obtained by going on the market and noting the all-wool stock selling for 17 1/2 cents a pound when fine medium territory wool is quoted at 65 to 70 cents. But such a test is not necessary. An inspection or handling of the goods shows that they are either wholly of shoddy or at best have but a sprinkling of new wool. Similar fabrics are found in the new lines of suitings. One sample of heavy suiting is made by a manufacturer who has done his best to turn out a cloth made of new wool that would yield a profit when sold at $1.12 1/2 a yard. It bears every indication of being made wholly of carpet wool. Although weighing only 16 ounces, it is stiff, hard and boardy, and is a mass of kempy fibers. These two samples represent the fabrics on which a large part of the carded woolen business is being booked. The pressure for low priced goods, made more severe by the general revolt against high prices of everything that makes up the cost of living has brought this situation about. The manufacturers are making a remarkable effort to satisfy the requirements of the trade. A few carded woolen mills that because of special conditions are maintaining their product at a high standard are incidentally demonstrating the capabilities of the carded woolen process of manufacturing.

Tare on Cotton Bales.

American cotton manufacturers continue to suffer because of the "cif and six" contract by which cotton is ordinarily sold to foreign spinners. Cotton is sold to American spinners with the tare guaranteed not to exceed a stated amount, usually 22 pounds to the bale. The foreign spinner under the "cif and six" contract is entitled to an allowance for tare of 6 per cent., or 30 pounds to the bale. When cotton is compressed in the South the compressor does not know whether it is for the American or foreign market. If he should put on a tare of 22 pounds and the cotton was sold for export the American trader would lose the difference between the

FIG. 1. A PART OF THE OLD BAGGING AND HOOP IRON FROM 410 BALES OF AMERICAN COTTON. THIS STUFFING WAS ADDED TO MEET THE "CIF AND SIX" TARE REQUIREMENTS.

actual tare and the 30 pounds claimed by the foreign spinner. Under these conditions the compressor adopts the sensible course of stuffing the bale with the cheapest material he can buy, usually old bagging and broken ties, to bring the tare up to the foreign standard of 30 pounds per bale, leaving the American spinner to claim for excess tare in case the cotton is sold to American mills. This is the reason for the excess tare on American cotton, an illustration of which was recently brought to our attention by an American spinner. He was at the time opening a 410 bale lot of cotton which showed an excessive amount of tare. At our suggestion he separated that portion of the tare which was evidently stuffing and had it photographed. This stuffing is shown at Fig. 1, along with the workman, who did not come in the bales, but was there to arrange the material for the photographer. Fig. 2 shows four bales from the lot as received at the mill, the stuffing being strongly in evidence. The manufacturer in sending these photographs, wrote us as follows:

> We have had some of the bales photographed and have also piled up the patches and enclose a photograph of them, together with short pieces of hoop iron which came with them. You will see on the whole bales how the patches were put on. Under these patches were found the pieces of baling ties, running from two to three feet in length.
>
> On the lot of 410 bales, the weight of extra pieces of bagging was 1,987 pounds and the pieces of hoop iron weighed 323 pounds. There is nothing in these two piles of burlap and hoop iron, as shown in the photograph, but what was extra bagging and ties, over and above the amount required for regular baling. That is, they did not include the hoops and bagging legitimately used.

FIG. 2. AMERICAN COTTON BALES, SHOWING THE STUFFING ADDED TO MEET THE "CIF AND SIX" TARE REQUIREMENTS.

The waste and burden of such a system of packing cotton for the market are beyond question. The cause is equally obvious. When an American cotton spinner encounters this difficulty, he should remember that it is the result of the "cif and six" contract, by which cotton is sold for export. The remedy for the trouble is another question.

From being at one time little more than an insignificant village, Bradford is now the largest city in the largest wool center in the world. In 1850 the imported wool amounted to 93,000,000 pounds, valued at $15,816,125, while in 1907 the quantity imported amounted to 488,000,000 pounds, valued at $107,063,000.

The Wool Growers.

The convention of the National Wool Growers' Association was held last month at Ogden City, Utah, too late for comment in our January issue. The two questions that claimed most attention at the convention were the revision of the wool tariff and the policy of the government in regard to the use of government land for sheep grazing. President Gooding in his opening address made these references to the two leading questions:

There is a general misunderstanding among a great majority of the people of the United States, some of them in high position, relative to tariff on wool. Even President Taft, in his Winona speech, expressed the opinion that perhaps the tariff charges on raw wool and manufactured woolens were too high, and that it was the only serious defect in the Payne tariff bill. People in general, in discussing the tariff on wool, think the cause of the raise in the price of articles manufactured of wool is due to the high tariff on that commodity; whereas, as has been stated many times before, if the raw wool was given to the manufacturer, it would not make more than about $2 difference in the price of the average suit of clothes, and of other woolen goods in proportion.

Public sentiment seems to be growing in favor of a reduction in the wool schedule. This comes about through merchants and others handling woolen goods stating that the high price of wool compels a high price for all goods made of wool, higher wages to the employes of railroads which haul this product to the manufacturing centers, higher wages for manufacturers' employes, higher pay to the tailors, to the wholesale dealers' help, and to the clerks in the stores. It is claimed that these advances in cost force the farmers to pay more for help to produce those things the people must have to feed and clothe themselves, thereby diminishing his profits. You must keep the farmer prosperous, for upon the farmer depends the very existence of the whole nation.

It is the duty of this association to be prepared at all times to fight any attempt to lower the tariff on wool. In this connection I would urge on the association the necessity of appropriating sufficient funds for the establishment and maintenance of a permanent press bureau and department of statistics. Through this agency I feel that the people in general could be educated to a thorough understanding of the truth of our claim that the tariff on wool cuts but little figure in the price that is paid for the woolen clothing they wear.

The forestry question is an all absorbing one with the western stockmen. This association has never opposed the policy of conservation through the creation of national forest reserves, nor do I expect that it ever will. But we have opposed certain rules and regulations that we deemed unwise and unjust to the great stock industry of the United States. The judgment of incompetent forest rangers in control of the national forests as to the carrying capacity of the great ranges lying within the national reserves has been the principal bone of contention between the stockmen using the ranges and the forestry bureau.

In my judgment the statement by Secretary Wilson of the agricultural department in this city last September has not been fully complied with. He said the fullest use of the grazing capacity of the national reserves must be had, as we are gradually falling behind in the meat production of the United States. The increase in population is much greater than the increase in the production of meat-producing animals. To do this we must not allow a blade of grass to go to waste in our national forests or elsewhere.

I believe that a better understanding is being brought about between the forestry bureau and the stockmen using the forest range. The appointment of advisory boards by the stockmen for the purpose of consulting with the supervisors of the different forest reserves as to their carrying capacity, and other difficulties that may arise between the users of these ranges and forestry officials, so far as I have heard, seem to be working in a satisfactory manner in most of the forest reserves that are managed along these lines.

In his report, Secretary Geo. S. Walker urged the establishment of a publicity bureau. He referred particularly to the agitation carried on by the carded woolen manufacturers during the past year, who, he admitted, have the sympathy of a large section of the public:

And while discussing this tariff situation I wish to suggest that your officers not only be provided with a sum of money adequate to continue the opposition to any reduction in the tariff on wool and woolens, but I, respectfully recommend that provision be made, or your officers authorized to arrange for the establishment of a wool tariff publicity bureau. The matter has been discussed at considerable length by your officers, and I am confident that you should provide a fund for this work and a bureau, manned by writers who are not only expert in tariff matters, but who are thoroughly posted in the intricacies of wool growing, selling, spinning, weaving and final manufacture of the product into cloth. These writers would have access to eastern magazines and metropolitan newspapers, and I am confident that they could be secured at reasonable figures to carry on the work, under the direction of your officers, of enlightening the wool-consuming public regarding the growing and manufacture of wool, and especially the workings of the Payne-Aldrich wool and woolen schedule.

I urgently recommend that your officers be empowered to establish this tariff publicity bureau and arrangements be made for carrying on the expense of the same, for just as sure as we are seated in this convention hall the tariff on wool and woolens will be again attacked, and unless the Congress and the general public are thoroughly

informed we may not be so successful next time. The eastern press has teemed with the arguments of the carded woolen manufacturers and others who seek free raw wool, and I regret to say that they have the sympathy of a large percentage of the public, among the congressmen, and even our chief executive has been impressed with the hue and cry that is going up on all sides for free wool.

Secretary Walker is evidently mistaken in regard to a demand for free wool. There has been no demand for free wool, or for a reduction of the wool duty, by either carded woolen or worsted manufacturers. The carded woolen manufacturers have worked for an equalization of the wool duty, and have urged that this could be best brought about by the adoption of an ad valorem tariff.

One of the speakers at the convention was Congressman Ralph D. Cole, of Ohio, who warned the wool growers of the political dangers that surrounded the wool growing industry, and urged a development of wool growing in the East, the reason he gave being, not the need of wool for clothing, but the need of votes in the House of Representatives for the maintenance of the tariff on wool:

It occurs to me as vital as the life of the wool industry in the United States itself, and that is this: That the production of wool in America must be nationalized. It must be nationalized for two different reasons. We have been falling off. Now, let me preface this by a statement. Not during the next one hundred years will the American production of wool overtake the increasing demands of consumption; and any fact or any element of fact that may have been lodged with the wool growers of the West to that effect that we eastern men may take up this profitable industry, put you out of business, is all foolishness. You can produce wool here better and cheaper than we can there, and if anybody would be run out of business we would get the first passport to the other shore.

I make this statement in advance: that by no possible means can American production of wool overtake and surpass the demands of American consumption. Now, why should this great industry be nationalized? Why should we take it back into the East, where it was, and in the South, and all sections of the country? Simply because we do not have the votes to protect it. Take the other sections—you have a great many senators out here, but you haven't so many representatives.

By the way, let me pause here in contemplation of the services rendered by the senators and members of the house of the West—in the preservation of your rights and the protection of your property. There are two men entitled to the undying gratitude of every American wool grower—East or West, North or South. Those two stalwart men that stood there and battled like Pilgrims for your interests during the "dog days"—Senator Warren of Wyoming and Senator Smoot of Utah.

W. W. Burch, of Chicago, made an address on sheep husbandry, from which we take this extract:

The President's recent utterance on the wool tariff question shocked and amazed the flock masters of the entire country, who voted and prayed for his election. His Winona speech is still fresh in our minds. The President accused the growers and manufacturers of holding up the Payne tariff bill, threatening to defeat it if any changes were made in the wool and woolen schedules. He said: "I am sorry and wish it had been otherwise; that the wool and woolen schedule is the one important defect in the present Payne tariff bill." He says: "The wool schedule is too high; it ought to have been reduced," and that "it represents considerably more than the difference in the cost of production abroad and the cost of production here." These are the President's own words.

We have won a great victory at Washington. All honor to the men who fought the battle for the flock masters. In the senate Francis E. Warren of Wyoming, that grand old hero of every wool tariff war for a quarter of a century; the doughty Tom Carter of Montana, and Senator Reed Smoot of Utah, the man they tried to unseat, but who still sits; William Whitman, president of the National Association of Wool Manufacturers; our old friend Harding, the manufacturer, and Steel, the spinner of wools; that grand old wool tariff veteran, Theodore Justice. In the house, Fordney of Michigan, and Cole of Ohio, and General Grosvenor, that old warhorse and friend and adviser of William McKinley, the great apostle of protection—these and hosts of laymen, all backed by the power and influence of the National Wool Growers' Association, won the day.

We cannot wrap the drapery of our couch about us and lie down to pleasant dreams. Danger lurks in the halls of Congress. Democrats and Republican tariff reformers and insurgents have marked the sheep industry for slaughter. The tariff reform press and the yellow journals are against us. The President himself has spoken. Tariff reform is in the air. In reality the fight is only begun. This association must continue its campaign. Gentlemen, keep your eyes on Washington.

Second only to the wool tariff in interest was the question of sheep grazing on public lands. A. F. Potter, chief of the grazing department of the Forestry Bureau, and the official representative of Chief Forester Gifford Pinchot, made an address from which this is taken:

When the control of the national forests was transferred from the interior department to the

department of agriculture, Mr. Pinchot sent me to Denver to represent the forestry bureau at a general conference. At that time the objection was made by the sheepmen that the grazing rates for sheep in comparison with those for cattle were too high. Their contention was not sustained.

I want to say that the sheepmen are cordially invited to come to Washington to discuss with the forestry department the rules and questions regarding grazing and other important matters affecting their industry.

The rates for grazing have been generally based on the proportion of 1 to 3, for sheep and cattle respectively. I say that these rates are only high enough to give recompense to the bureau for its service in the forests. I think the minimum should be 3 cents on sheep and 15 cents on cattle.

President Taft is eager to make both ends meet, to keep the receipts equal to expenditures in conducting the government, and to prevent the repetition of the big deficits. For this reason we must charge the fees now levied in order to collect revenue. But the forestry service is not supposed to be on a commercial basis, nor has it been since the changes made in the law in 1907.

The appropriations committee of Congress would not look with favor upon a reduction in grazing or other fees attached to the forestry service, I am certain.

It is not the forestry service which is causing the reduction of herds on reserves. It is the rapid settlement and development of the country and the resulting increase in privately owned ranges. The live stock men must give way to the march of settlement and the growth in population in hitherto sparsely settled districts.

Our policy will be to make the reductions as slowly as possible under existing conditions. But the forest reserves have been greatly improved, so that on the whole I think conditions are much better. As a matter of fact, in 1909 there were a million more sheep and cattle on natural increase in stock, grazing on the forest reserves, than there were in 1908.

One of the most important matters was dwelt on by Secretary George S. Walker, of Cheyenne, in his report to you. I agree with him on the question of uniform bounty laws. We have hired men known as experienced hunters and placed them as forest guards to kill the predatory wild animals. If you can influence legislation so that the forest service can cooperate with you and help you to pay expenses and bounties for the killing of these pests, I and my aides will only be too glad to join with you in this fight.

That Mr. Potter's reasonable proposition regarding the use of government land by the wool growers met with no sympathy from his hearers was made evident by a dramatic incident during the day. A few hours after he had finished his address the convention was thrown into a tumult of rejoicing by a despatch from Washington announcing that the President had dismissed Gifford Pinchot from the forestry service. In the midst of the uproar President Gooding, of the Association, rose and shouted amid a storm of cheers:

Gentlemen, last night, with the fall of Gifford Pinchot, an epoch in the conservation of our national resources was closed. Let us hope that hereafter we will get a square deal in the West, and that, with the passing of Pinchot, we shall see the death of Pinchotism. It was not the man but the system which we fought. And that system continued under any other man will be just as detestable. The people of the West have always been for the sane conservation of our natural resources, but they never could sanction the ruination of great industries that support millions of people.

The wool growers of America demand of President Taft that, in appointing Gifford Pinchot's successor, he will try to give us a man who will really cooperate with us. We don't want a man who will pick subordinates for the purpose of harrying the sheep industry. We want fair treatment, and we will get it, if the fight never ends. The forestry bureau can depend on that. We will have justice, or we will fight to the death!

THE COMING TEXTILE ASSOCIATION.

An exhibition that is creating much interest is the one to be held in Mechanics Building, Boston, April 25-30 inclusive, under the auspices of the Textile Exhibitors' Association.

This association was formed last year for the purpose of holding annual exhibitions in connection with the textile industries. The first exposition was so successful that not only those who exhibited last year, but many other firms have already signified their intention of taking space at the second exhibition.

Chester I. Campbell, the secretary of the association and also the general manager for the exhibition, is probably the best known man in his line in the country. His record is one of uninterrupted success. Last year he took charge of the association at very short notice and the result is well known. While the number of exhibitors was not very large, the display of products and machinery was of great interest, and the results were highly satisfactory to the exhibitors.

The general scope of the exhibition has been enlarged this year to include textile

machinery, mill supplies, appliances, general textile products, finished products and a general display of concrete mill construction, which should prove a great interest to the Eastern mill owners.

The National Association of Cotton Manufacturers will hold their annual conventions in Mechanics Building during the exhibit as guests of the Textile Exhibitors' Association and it will afford an excellent opportunity of getting in close touch with the cotton industry from all over the country. Manufacturers of textile machinery equipment and supplies will do well to profit by the opportunity and make a good showing of what they have to offer to the trade. For all particulars, regulation and application blanks send to Chester I. Campbell, General Manager, 5 Park Sq., Boston.

The consumption of cotton in 1909 was 9,370,000 bales by the European mills and 4,766,000 bales by the United States mills.

THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.

The annual meeting of this association will be held on Wednesday and Thursday, April 27-28, at the Mechanics Fair Building, Boston. The Textile Exhibitors' Association will have an exhibition of textile machinery and products during the last week of April in the same building.

The program for the meeting is in an advanced state of arrangement, although there is room for more papers on cotton manufacturing. Invitations were authorized to several prominent specialists to contribute papers upon subjects pertaining to cotton manufacture, especially on the finishing of goods.

William B. Hawes of Fall River was elected to fill the vacancy on the committee on standard specifications for staple gray goods caused by the death of Alfred M. Goodale.

Seasonable Fabrics.

DRESS GOODS.

The dress goods market continues to show increased demands for all grades of spring dress fabrics. In fact large orders are being received for later shipments from buyers who feel confident that the spring and summer trade on wool dress goods will be much larger this year than during former seasons. The manufacturers are sold ahead on most of the popular weaves and in some instances have withdrawn their lines from sale. With the demands for these fabrics increasing as the season progresses it is already evident that there will be no excessive stocks of dress goods during the season.

Plain colored fabrics are the leading sellers for spring. The demands for all grades of serges has been one of the features of the market. These goods are short in supply, especially in navy and black. The unusual demands for cream serges, diagonals, panamas and other popular weaves for early shipments has exceeded the supply.

Light weight spring fabrics such as wool taffetas, prunellas, voiles, batiste and henriettas continue to find a ready market in full color assortment.

The early spring trade for mohairs, sicilians and brilliantines, both in plain and fancy weaves, continues very active. Several importers are offering a mohair crepe in qualities costing from 87 1/2 cents to $1.05 a yard. These crepes are 40 inches wide and are of a much stronger texture than a silk crepe, but are finished with a very high luster, giving a silk effect, which the importers think will be a much more desirable fabric than the silk crepe.

In fancy dress goods the trade are favoring worsteds and homespuns in grey mixtures. Wide wale diagonals and herringbone weaves in the better qualities costing from 95 cents to $1.35 a yard, 54 inches wide, are being used in large quantities by the cutting-up trade. The demands for neat stripe effects has been very active. A fabric is sold by Franz Merz at $1.20 a yard, 54

inches. A 54-inch shaded hair-line stripe is offered by L. F. Dommerich & Co. at $1.27 1/2 a yard.

SILKS.

While the early demands for silk fabrics were not as large as in former years, the manufacturers feel confident that as the season advances trade on the different fabrics will increase. Indications point to a favorable spring and summer trade on all grades of silks, especially as silks are being offered to the trade at about the same prices as last season. Reductions of about 5 per cent. have been made on some lines.

Shantung and pongee silks continue to be among the leading fabrics. These goods are made in a number of new tints and pastel shades. The new shades have been taken by the trade in the better qualities costing from 75 to 95 cents a yard.

The demands for foulards and other printed silks has not been as large this season as in former years. This is due to the hesitation of buyers in placing their orders in advance. The early demands for these silks favor the staple designs, especially in old rose, catawba, wisteria, copenhagen, mulberry and green.

That plain colored silks will hold a strong position in the market during the coming seasons is evident from the demand for satins, messalines and other satin faced silks. These messalines are favored in the wider goods, as they can be used to much better advantage both in cutting and draping.

Stripes continue to predominate over checks and plaids in the fancy silk market.

The demands for plain colored taffetas has increased with the opening of the spring season. The manufacturers making the better grades of plain colored taffetas report that they have received a healthy trade on full color assortments.

The demand for silk and cotton mixed fabrics has been one of the features of the silk market. These fabrics are being shown in plain weaves, jacquard patterns and printed effects, and are being used very successfully in place of low grade all silk fabrics.

COTTONS.

The cotton goods market continues to gain strength, especially on the fabrics that have been popular for the early spring trade. The demand for these different weaves such as mercerized poplins, repps, pongees and linen finished fabrics in all of the new shades, is exceeding the supply.

The spring wash goods trade has opened with unusual activity this season. Conservative buyers are placing re-orders on all popular wash fabrics. The general feeling prevails that this will be one of the largest wash goods seasons that the market has ever had. Plain woven fabrics continue to be favored. Fancy jacquard effects, self colored stripes and diagonal weaves are very popular in qualities costing from 15 to 22 1/2 cents a yard.

The demands for light weight printed fabrics such as batiste, lawns and organdies is very active. The trade favors these goods in the tinted grounds with small, neat patterns. Several of the mills making these goods have sold their production for the season.

The mill agents of dress ginghams report that their mills have made exceptional early shipments this season on all lines of ginghams. Shipments on imported ginghams have not been so prompt, but the importers look forward to having their early shipments completed on time. Surplus stocks of dress ginghams are very low, if the present demands continue during the season.

The spring trade on 36-inch percales, printed madras and galatea cloths has been very large. Stripe effects have predominated over checks and figures.

The manufacturers of domestic staple cottons continue to hold their lines at value. The jobbers are offering stock goods only at the market prices. The market continues very firm on all lines of staple cottons. The buyers feel that no change in prices can be looked for in the near future.

Several mills catering to the advance order trade have opened their lines of outing flannels, flannelettes and blankets for the fall and winter seasons of 1910 and 1911.

Advances of 5 to 10 per cent. have been made on these lines for the coming seasons. The mills making the most popular brands have advised the trade that their production will be limited and early selections will be necessary in order to secure complete assortments.

COST OF POWER.

BY CHARLES T. MAIN, and F. M. GUNBY, BOSTON, MASS.

(Read before the Boston Society of Civil Engineers.)

Twenty-five years ago, the expression "cost of power" was fairly well defined as meaning the yearly cost per indicated horse power, if produced by steam; or power on the wheel shaft, if produced by water for ten hours a day and about 308 days a year, or for 24 hours for the same number of days. This was fairly well understood by those who had to deal with these matters and who gave the matter any thought.

Since the time when mechanical transmission of power was principally by shafting, belting and ropes, there has been developed the electrical transmission of power now so commonly in use, with new units of power as the electrical horse power, and the kilowatt, which is equal to 1.34 electrical horse power.

There has also come into common use the steam turbine for which there is no indicated horse power, the measurements of power from which must be brake horse power, electrical horse power or kilowatts. There is the power produced by water wheels, which is gross horse power, net horse power at the wheel shaft, and, when transformed into electrical power, e. h. p. and kilowatts.

Today the statement "cost of power," unless clearly defined, may mean one of many things, and the men who were used to thinking in indicated horse power are sometimes at a loss to know what is meant when the cost is stated as so much per kilowatt, delivered. It must be translated back into indicated horse power or its equivalent, before there is any definite impression made on their minds.

There is another source of great confusion on account of the fact that during this period of time, there has been developed industries like electric lighting and street railway plants, in which the load is extremely fluctuating, in which, therefore, the cost per h. p. of unit of product, is more and cost of plant more than for steady loads.

Now that electrical transmission has been developed so that the current can be transmitted and used at a distance, it must be sold as electric current, delivered, and if a price is quoted to a mill manager, at $32 per k. w. delivered, he says: "How much is this a h. p.?" and you answer, "$24." He then says: "I can beat that in my engine," and when he says it, he is thinking of indicated horse power at about $20 a year a horse power, with no allowance for friction loss in the engine or transmission to the same point where the electric current is delivered.

If lighting current is offered to him at $3.20 per k. w. hour, he says: "How much is that a year?" You reply: "For 3,000 hours it is $96 a k. w. or $72 a h. p." "Well," he says, "that it is outrageous when we produce at $20 a year a h. p."

It may be possible that he can beat the figures presented to him, but there is a reason for this discrepancy between his conception of what prices ought to be, and what they must be.

The cost of power and the value of steam and water power to the various industries varies within very wide ranges, and it seems to us that we could spend an evening to advantage in going over these matters in an informal way, by citing some actual cases. Some things may not be stated in logical sequence, as they would be in a formal paper.

Steam power costs the most per unit of power when produced in small amounts and the cost is increased for fluctuating loads when used for purposes where the load factor is small. By "load factor" we mean in this particular instance, at least, the average output in per cent. to the full load capacity of the plant. We can eliminate largely tonight the discussion of cost of power in very small amounts.

Loads with small load factor are obtained in electric lighting and street railway plants,

in which cases also there is generally no use for the by-products of power so to speak. Steam power costs the least per unit of power for comparatively steady loads and the cost is still further reduced where there is use for exhaust steam on the overflow water from the condenser. Such conditions as these are found in colored textile mills. Another example of the low net cost of power is in steel mills where the waste gases of the furnaces are used, either for the production of steam or used directly in gas engines. Between these extremes are various industries for which the cost of power will vary greatly.

A general summary of the situation in this vicinity might be somewhat as follows:

1. Power in small amounts and with varying demand can be purchased from about 10 cents per k. w. hour, in five k. w. lots down to about 6 cents a k. w. for 100 k w. lots, where the demand is used for about 50 hours a month.

2. The rate for permanent or steady power for 100 k. w. demand for 300 hours a month would be about $2.68 per k. w. hour and for 500 hours a month would be about $1.84 per k. w. hour.

The two mentioned conditions are only used for illustrations to show normal cases, as in a city like Boston.

3. Assuming a plant of 2,000 k. w. capacity, the approximate costs and prices for power are shown in the following table:

COST OF POWER OF VARIOUS INDUSTRIES.

Kind of Plant and General use.	Hours per Year.	Cost per Year. M.S.	M.H.P.	I.H.P	Cost per K.W. Hr.
Textile (Engine)	3,000	$32.00	$23.80	$20.80	1.065c
" (Turbine)	3,000	29.00	21.60		.965c
Paper Mill (Engine)	7,200	57.00	42.50	37.00	0.792c
" " (Turbine)	7,200	52.00	30.60		0.734c

The above figures for cases where no waste products are used for manufacturing.

a. For electric lighting or railway work with a load factor of 30 per cent. about $1.55 per k. w. hour, or $40 per k. w. year. This is $29 per h. p. year or an equivalent of $26 per I. h. p. year.

b. For paper mill work, 24 hours a day, 6 days a week, power only, $57 per k. w. year, or .722 cents per k. w. hour for engine plant, or about 8 per cent. loss for the turbine plant. If the waste products are used for manufacturing, these costs might be reduced by about one-third (1/3).

c. For industrial plants 10 hours a day, 300 days a year. Straight power $32 per k. w. year. If heating is done, by exhaust steam, these figures may be reduced by about $1.20 per k. w. or to say $36 per k. w. year. This would be about $23 per e. h. p. and $20 per i. h. p. year.

d. For plain textile mills, same as "c."

e. For colored textile mills, making use of exhaust steam and water of condensation. The original cost of straight power same as "c." This may be reduced by using the exhaust steam and waste products by from $2 to $12 per k. w. year, depending upon the amount of steam and waste products used.

f. Common price for hydro-electric power, 24 hours a day, 6 days a week, $30 to $40 per e. h. p., or $4 to $53.50 per k. w.

g. Common price for hydro-electric power 10 hours a day, 3,000 hours a year, $20 to $25 per e. h. p., or from $27 to $33.50 per k. w.

South African Wool.

The governments of South Africa are taking an active interest in the development of wool growing in the colonies, and incidentally setting a good example for the United States government, which has shown a marked indifference to the domestic wool supply. A commission, consisting of two Boers and an English settler was sent to Australia four years ago to purchase sheep and study the question. An Australian classer was brought with the sheep to teach the farmers how to sort their wool and prepare it for the market, and it is stated that the wool so prepared is sold at London bearing a mark indicating that the wool was packed under the supervision of an official

inspector. T. A. Moore, a Huddersfield wool dealer, who visited South Africa at the invitation of the government of the Orange River Colony, recently delivered a lecture on the subject before the Huddersfield Technical College. We take the following from the report of remarks:

He had accepted an invitation from the Government of the Orange River Colony four years ago to pay a visit to South Africa, and he conferred with the Boers as to the best means they could adopt to improve and increase their wool production. He then strongly urged the importation of 10,000 stud sheep from Australia, and within a few months a commission consisting of two Boers and an English settler was sent to Australia for that purpose. They purchased 7,000 rams and ewes, and since then extensive importations had been made each season, so that at the present moment 10,000 high-class Wanganella, Boonohe, Tasmanian, and South Australian sheep, all pure merino sheep, were in the Orange River Colony. An Australian classer had been retained to assist the farmers to sort their wool and put it up in marketable shape, and now it was quite usual to see in the catalogues of the London sales the intimation that the wool had been sorted and packed under the supervision of the Government inspector. This Australian classer was training a number of young Dutchmen to do similar work, and soon every district would have its own qualified wool inspector. Shearing oftener than once in twelve months was rarely resorted to except in cases of scab or other sickness.

With the assistance of the staff at the Huddersfield Technical College experiments had been made in scouring and dyeing, with most elaborate tests, to ascertain whether the wool suffered any loss of weight or strength from the action of the dip tried in South Africa, which was a solution of 5 lbs. of caustic soda and 20 lbs. of sulphur in 100 gallons of water. In every way the experiments were satisfactory. On receipt of his report the Orange River Colony Government officially recommended the caustic soda and sulphur dip, while the Cape Government went a step further and gave notice that that was the only dip that they would recognize in the case of a compulsory dipping order. The production of wool had engaged the serious attention of the British South African Company, and in course of time they would see considerable quantities of merino wool exported from that rich colony Rhodesia. Eventually Rhodesia would send thousands, perhaps hundreds of thousands of bales, but at present it was a sheep country in the making.

The number of cotton spindles operated in the world during the year ending Aug. 31, 1909, was 133,377,000, and the quantity of cotton consumed by them 19,397,000 bales, indicating a weekly consumption of about 373,000 bales.

WAGES AND WORKING TIME IN ENGLISH COTTON MILLS.

The following report on wages and working time in English cotton mills has recently been made by the United Textile Factory Workers' Association:

In response to the request of our German colleagues, contained in the last number, the following statement of hours and wages in the English cotton trade has been prepared from information obtained from the workers directly affected. The wages given are in all cases for a full week's work of 55 1/2 hours on the prices paid during the present year—1909—and refer only to the cotton trade.

MINIMUM RATES OF WAGES PAID IN CARD AND BLOWING ROOMS: AVERAGE COUNTS.

Blowing Room: Combined machines, $3.03 and $3.40 per week per machine; Finisher Lappers, $2.36 per machine; minimum wage per man, $7.05.

Cardroom: Cost per Card, according to weight carded per week; average, 51 cents per card; minimum wage per man, 51 cents.

Drawing Frame Tenters: 18 deliveries, $5.69; 24 deliveries, $7.17.

Slubbing Frame Tenters: 84 spindles, single frame $5.35, pairs $5.75, assistant $2.68; 100 spindles, single frame $5.59, pairs $6.01, assistant $2.81.

Intermediate Frame Tenters: 124 spindles, single frame $4.82, pairs $5.61, assistant $2.63; 140 spindles, single frame $4.96, pairs $5.79, assistant $2.71.

Roving Frame Tenters: 164 spindles, pairs $5.08, assistant 2 pairs $2.53; 200 spindles, pairs $5.36, assistant 2 pairs $2.67.

Can tenters' wages, for taking out cans at card fronts, $3.40 per week.

COTTON SPINNERS.

In the mule spinning departments, where the workers are all males, the wages vary according to the sizes of the mules and the counts of yarn being spun. Where short mules are in use, the wages are in some cases as low as $8.26 per week, while in the case of the larger mules it is very common for the weekly earnings to be over $12.15. The average number of spindles in mules spinning twist yarns is about 980, and the average wages about $9.72 per week. In weft mules the average number of spindles per mule is 1,200, and the spinner's average wages $10.69 per week. The general average wages for all classes of yarns together may be taken as $10.21 per week for a spinner minding a pair of mules of average size.

It is usual for each spinner to have two piecers, but on very short mules he may have only one, while on very long mules three may be employed. The younger of these piecers, or assistants, whose ages vary from 12 to 15 years, are paid from $2.19 to $3.28 per week, the average being rather over $2.79. In the case of the older assistants, from 15 years upwards, the wages are from $3.77 to $5.59 per week, the average being about $4.60 per week.

BEAMERS, TWISTERS, AND DRAWERS.

Beamers: 80 per cent. of these people work on weekly wage. For colored cotton goods prices vary. The beamer working on all colored goods will average $7.29 per week. The wages vary from $6.80 to $8.02 per week. This variation of price is caused owing to varied sorts. The 20 per cent. who work on piece rates will average on colored work $7.65 per week. Beamers on grey goods will average $6.80 weekly, whether on day wage or piece rate.

Twisters: Twisters, like drawers, have no machinery to assist them in their earnings, consequently their wages depend entirely upon their own speed and effort. The average twister will earn $6.92 weekly. There are many who can earn over $7.29 per week, but these are not the average. Some aged may not average above $3.65 weekly, but the average will earn, and do earn, $6.80 weekly.

Drawers: These wages will average quite $8.26 weekly. It is all a question of speed and ability of the individual. The wages vary from $6.32 to $11.18. In a few cases the $11.18 will be exceeded, but these are exceptional. This wage is left after the drawer has paid his reacher.

The whole of the foregoing particulars of weekly earnings in the departments mentioned are based upon reliable information, obtained directly from those concerned throughout the cotton spinning and manufacturing districts of Lancashire and adjoining counties.

AVERAGE WAGES OF WEAVERS.

Average wage per week per loom:

Alhambra and other Quilts	$1.58
Bedford Cords	1.73
Brocades, Jacquards	1.74
Checks, Oxford Checks, and so on	1.66
Cords or Stripes, plain weave	1.51
Crimps	1.59
Dhooties and Dobby Dhooties, grey or colored	1.55
Shrtings, Printers, Cambrics	1.47
Sateens, Drills or Jeans	1.61
Lenos	1.91
Stave Cloths	1.62
Fustians	1.42
Towels	2.25
Sheetings	2.03
Loop Cloths	1.66

Average weekly wage of:

Winder	4.09
Warper	5.35
Reeler	3.73

Reducing the average by 48 cents per loom will allow for the payment of the tenters engaged by some of the weavers, and will give a fair approximate earnings per loom each week.

Young persons of either sex, from 14 to 16 years of age, mind two looms. Young persons of either sex, from 16 to 20 years of age, mind three looms. Weavers of either sex mind four looms from 20 years of age and upwards.

The average refers to ordinary looms, other than Northrop and sheeting looms. Towel weavers never attend to more than two looms.

Vegetable Fiber in Wool.

At a recent meeting of the Bradford Chamber of Commerce letters were read from the two representatives of the Chamber who had been sent to Australia to attend a conference to consider methods of preventing vegetable fiber from getting into wool. The following reference was made in the letters to an improved wool pack used by Dalgety & Co. of Sydney:

The pack was an ordinary Calcutta pack put through a solution of algin and rolled out to a perfectly smooth surface. Messrs. Dalgety had so much faith in the process that they had already ordered 50,000 of the new packs. Whether the sizing would last for several months through many changes of temperature had, of course, still to be proved, but if successful in this respect, there was no reason why the process should not be universally adopted, as the cost was only from 3d. to 6d. per pack, to which no grower would object. We both believe that the pack is by far the best of those so far seen.

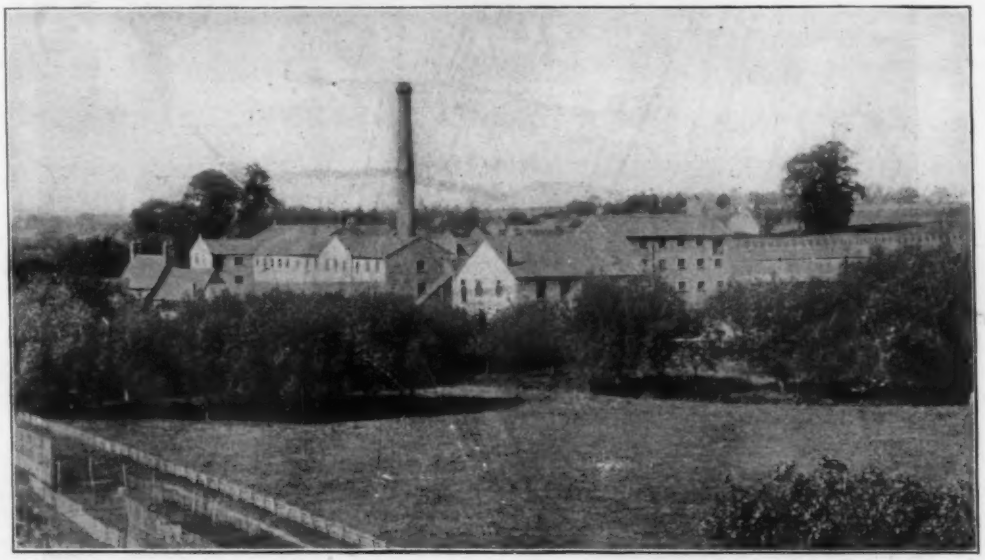
Moving Cotton Bales in Warehouses by Compressed Air.

The superintendent of a large cotton mill happened to be around his cotton warehouse not so very long ago where he had a number of men at work moving cotton bales about. He was struck with the length of time it took six of the men to move the cotton and fell to thinking that here was a fertile field for his "well known" inventive genius. He looked around the mill and found just what he wanted in the shape of some piping which lay rusting outside the door. He took a piece of it into the machine shop and had the mechanic bore it out and cut a cylinder 12 1/2 inches in diameter, making the completed cylinder 3 1/2 feet long, allowing a piston play of 3 feet or 6 feet both ways. An inlet and an exhaust valve were placed in the head of the cylinder and power was obtained from the air compressor. The exhaust, like that of the inlet pipe, is about 1 inch in diameter and is controlled by a key valve. The whole mechanism is bolted to the floor and is operated under a pressure of 80 pounds per square inch, which delivers over 9,000 pounds pulling power per area of piston, or enough to raise 2 bales of cotton at one time. This simple and inexpensive mechanism is connected to three pulleys of the triple block type which are arranged in 7 to 1 ratio, thus giving the rope 21 feet of up or down travel. This distance could be increased, of course, by lengthening the piston rod. A great advantage of this device, outside of the saving of $14 to $20 per day, lies in the great range of control which can be had in raising or lowering a bale of cotton, since air, unlike steam, can be shut off at will and the bale held without any brake other than the air in the cylinder.

Blanket Making at Witney.

BY WESSEX.

A law case of which some echoes have reached America brings Witney into view. Witney, a little Oxfordshire town of 3,500 inhabitants, has been a textile center for a thousand years. There were cloth fullers there in 969, the days of King Edgar. Blankets have been made in Witney for three, four (some say five) hundred years and the Early's, the chief manufacturers in the place, have themselves been "blanketers" for two and a half centuries. In short, Witney and blankets have been associated most of the time since 1320, when a woolen fabric having a long raised nap was invented by Thomas Blanket of Bristol. Witney was exporting rugs and blankets to Africa in 1641 and in 1677 was reported to be supplying "huge quantities" of blankets and Duffields (otherwise known as shags and trucking cloths) to the red men of Virginia and New England. These Duffields, which owed their name to a town in the Low countries, were 30 yards long, three-quarters wide and red or blue in color. Merchants did "truck them for Bever, other Furs of several Beasts &c" says the worthy Dr. Plat, who notes one of the scandals of that period. Merchants, it appears, "abused (the Indians) for many years with so false colors that they will not hold their gloss above a month's wear." He adds that an ingenious person of Witney has "fixed upon a true blue dye with an eye of red (indigo?) whereof as soon as the Indians shall be made sensible no doubt the trade will be advanced again."



THE WITNEY MILLS. BLANKET MILLS OWNED BY THE OLDEST WOOL MANUFACTURING FAMILY IN GREAT BRITAIN.

Witney thus has special claims upon American attention none the less because it has reformed its evil ways and with the assistance of the best Yorkshire machines and Yorkshire experience is turning out a high class of goods. Although geographically a part of the West of England, Witney stands apart and alone from the towns of that section, in which beavers and doeskins and worsteds and tweeds are made. Its mills are three and belong to C. Early & Co., W.

Smith & Co. and J. Marriot & Co. Its looms number something less than 300 and its goods are "Witney" or "Real Witney" blankets. These are blankets with a blue or other heading, a whipped or bound edge and a full pile, slightly more raised on one side than the other. They are manufactured entirely by the usual processes from fleece and skin wools and noils of British and colonial origin. The wools are blended, willowed twice, carded twice, condensed, mule spun, scoured in alkali, fulled under stocks, milled by machine, washed, hydro-extracted, sulphur-stoved, tentered and dry-raised quite like any others in any part of the world. I am sending a sample blanket of Witney-type made in the same way in Yorkshire. [This can be seen at our Boston office. Ed.] The type is in contrast to the "Bury" or cloth blanket, which is either not raised or only half-raised, and to the "Ayrshire" or twill blanket. For seventy years, at least, blankets of the sort and called by the name "Witney" have been made in Yorkshire. In the same county there is also the verb "to witney," i. e., to pass cloth for overcoatings through a napping machine cutting it into wave-like serrations such as occur on a Witney blanket after being worn.

Witney, however, had priority in the use of its own name, albeit not as applied to blankets of the improved modern type. The dry-raising gig was invented and used in Yorkshire and to the latter place is due the credit of improving the manufacture. Witney had certain grounds of complaint, for its name was being attached to low-class blankets made in Yorkshire or imported from Germany and these goods did the name discredit. The Witney manufacturers brought action under the Merchandise Marks Act and at the pinch Wormalds & Walker, Fenton's, J. S. Walker, Oldroyd's and the other Dewsbury (Yorkshire) men failed to con-

EARLY'S WEAVE SHED, WITNEY.

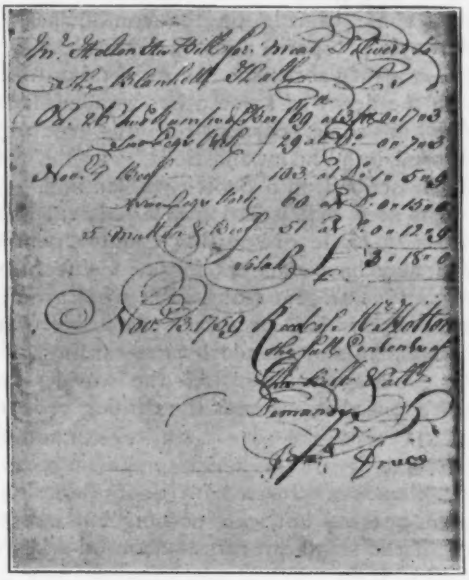
vince certain legal luminaries that the place name had been a common name prior to the year 1887. Subject to appeal, all rights in that name have been transferred to three manufacturers who have not between them plant enough to make one-third of the Witney-type blankets produced in this country. The position is fantastic, for while Witney insists that Yorkshire goods cannot be "Witneys," it is itself labeling certain qualities

SEAL OF THE BLANKET COMPANY, A GUILD INCORPORATED IN 1710.

with the place names, "Saxony" and "Bath." The law has upheld them and Yorkshire has apparently abandoned the fight. It is now announced that the Yorkshire makes will be called "Yorkshire" and that Yorkshire makers will cease to advertise the home of their rivals.

The exact circumstances will scarcely duplicate themselves in America, but the success of the original holders of the title may not be without its moral. The Witney men sell direct to retailers, principally to London shops. The Yorkshiremen sell principally to wholesale firms. Witney and the London drapers were in direct touch and so it came that man after man of London drapery buyers went into the box to say that they understood Witney to mean Witney-made. Indeed they could understand nothing else, knowing nothing of the district in which two-thirds of the Witney-type article is made. For legal purposes the shopman who does not know a warping-beam from a shuttle and who probably never saw a mill, is an "expert." To this fact, to certain vacillations in naming Yorkshire blankets at the time the Act in point was passed, and to the construction of the law, Witney owes its victory. Possibly that victory will be of considerable use. Possibly it will be discovered that everybody has over-estimated the use and value of the Witney name. Time must determine.

While the foregoing may satisfy curiosity as to the recent differences it does not explain the continuance in existence of a considerable blanket manufacture in an isolated spot. Why did "blanketers" thrive at Wit-



BILL OF MEAT SUPPLIED TO THE BLANKET HALL IN 1759. MANUFACTURERS WERE FINED FOR NON-ATTENDANCE AT DINNER. BEEF, MUTTON OR PORK ARE ALL CHARGED AT 3 PENCE (6 CTS.) A POUND.

ney; was it that "abstersive nitrous" water of the River Windrush to which Dr. Plat refers, that caused their efforts to succeed? Or was it, as some thought in 1677, that Witney blankets owed their fame to "a peculiar way of loose spinning that people have hereabout"? The point is not easily cleared up after this lapse of time. Evidently the

local labor had a certain aptitude and it was abundant in Dr. Plat's time when "3,000 poor people from children eight years old to decrepit old age" were working up 100 packs (240 lbs. = 1 pack) of wool weekly. With machinery the local industry employs 800 to 900 people now. We know that the local manufacturers produced a good quality of stuff, that they sold direct to the retailer, that they brought into the district the most economical and perfect types of machinery. We may infer that the blanket manufacturers worked, that unlike some deceased silk throwsters and woolen manufacturers in the rural parts of England, they did not expect to get five days' hunting a week or proceed to spend everything on themselves and nothing on the mill. These considerations may have some bearing on the continuance of Witney's prosperity; just as considerations of a contrary sort have had everything to do with the decay of some other woolen industries in some corners of this country. "Closed by Whisky and Soda" was the epitaph inscribed on a Scotch woolen mill.

It is seen that isolation in a pleasant spot among a circle of sporting country gentlemen may have dangers for a manufacturer or his sons or grandsons. But what are the advantages? It is necessary to consider first that blankets are made by the carding, not the combing process. All the world's experience is that, whereas the carding process tends everywhere to remain self-contained, the combing process tends to split into several elements. It pays to do nothing but comb, nothing but spin, nothing but weave, etc., if the single process is done on a large enough scale. When specialization sets in and mills have to lean on each other, our Oldhams and Bradfords and your Lawrences are produced. Where there is no scope for infinite expansion on standard lines isolation is neither impossible nor necessarily uneconomical.

Witney chances to be 75 miles only from London and has consequently low freight on imported wools and on finished goods. Although far from the coal field it has auxiliary power in water. The wages of the unskilled in the West of England are determined largely by agricultural conditions and this means that, in comparison with the towns, labor is cheap. If that were otherwise it would still be true that mills supply the employment that the farms do not. They employ girls and women and when cheap rents and local taxes are added to cheap freights, power and labor it is clear that a country situation has its commercial advantages. Its aesthetic advantages, its benefits to the life of a nation are obvious and go beyond the present question. I leave them aside and close, but not without a note as to what a large manufacturer or a group of manufacturers public-spirited enough to maintain a certain level of excellence, can do. He or they may make their woolens a standard and their place-name as effective as the magic name "Sheffield" on knives.

THE CHEMIST'S PLACE IN POWER ECONOMY.

The aim in modern industry is "increased efficiency of production." The day of cheap raw material is passing, if indeed it has not already gone, and industry faces a new set of conditions. In the production and transmission of power there are great opportunities for improvement, for the saving of time, labor, and money. That the chemist ought to take the foremost part in solving the problems of power efficiency is the argument convincingly set forth in a paper read before the recent convention of the American Chemical Society by Arthur D. Little, the engineering chemist, of Boston. Mr. Little makes a vigorous presentation of the chemist's special qualification for dealing with questions of energy and urges a stand against the customary monopolizing of power problems by the mechanical engineer, his address being in part as follows:

"Chemists sometimes forget that their science deals with energy no less than with matter, and that in fact chemistry as a science began with the recognition of the principles, materials, and products of combustion. They have allowed the mechanical engineer to usurp many things which prop-

erly come much more directly within their own province.

"The combustion of coal is a typical chemical process. The selection of the most efficient coal and the determination of the conditions necessary for its most efficient combustion are essentially chemical problems. Chemical problems also are those arising in the manufacture of producer and illuminating gas, their utilization in gas engines, the development of power from the waste gases of the blast furnace, the adaptation of conditions to the proper handling and burning of peat, lignite and waste coal, the thermometric exploration of coal piles to forestall spontaneous combustion, smoke abatement, the control and improvement of fireroom conditions by draft regulation, flue gas analysis, temperature measurements and even the placing of firemen on the bonus basis. Taking power plant practice and the conditions of coal purchase as they stand, the properly equipped plant should be able to increase the efficiency of power production from 5 to 30 per cent.

"The analysis of boiler compounds as an end in itself presents little to excite enthusiasm, but when such analyses are made the means of saving $3,600 a year in the power plants of a single company they take on a new and larger aspect, not only in the mind of the chemist but in the mind of the chemist's client.

"The chemist who attacks the problems of power production will not hesitate to go outside the laboratory and take his property wherever he finds it. He will conduct boiler and engine tests, study the efficiency of grates and stokers, familiarize himself with the low pressure turbine as an agent in efficient power production. While straining every resource of his science to produce steam economically by the combustion of coal, is it common sense for the chemist to stop there in ignorance of the fact that the efficiency of that steam can be increased at once from 25 to 100 per cent. by coupling a turbine to the exhaust?

"The distribution of power supplies problems no less directly within the province of the industrial chemist. He may begin with the analysis of lubricating oils. He proves his own inefficiency if he stops there. He must inform himself regarding the market prices of oils used elsewhere for similar service, the adaptability of the oils in question to application to the bearing by soaked waste, sight feeds, or gravity cups. He must be prepared to interpret his analysis in terms of practice, and to follow the oil through the plant in order to prescribe conditions which shall keep down waste. There are few plants in which the industrial chemist working along legitimate lines cannot save from 20 to 60 per cent. of the entire lubrication account, while the oil analyst has to his credit merely a few figures which his client probably fails to understand.

"The efficiency and life of bearing metals varies over an extraordinarily wide range. Some are merely the refuse from type foundries, others are so carefully adapted in their composition to the requirements of particular service as to show an efficiency fifteen times or more as great as that of inferior material. Here again the mere analysis means little, the practical question is, 'Which is the more efficient metal under the conditions imposed by practice?'

"Much additional might be said regarding the opportunity before the chemist when any material concerned in power transmission is the subject of his study, whether it be leather, rubber or canvas belting, belt dressings, insulating material, trolley wire, trolley cars or trolley wheels. In every case it is within his power to create new standards of efficiency."

The worsted tops combed in British mills in 1907 on commission amounted to 168,889,000 pounds. Only 19,856,000 pounds was combed for sale.

In Harris, Scotland, there are approximately 600 families engaged in weaving homespuns, each family weaving on an average three to four pieces per year, 35 yards to the piece, and receiving for the finished cloth about 73 cents per yard, a family realizing for their year's communal work from $146 to $194.66. The total annual output of Harris and vicinity is about $340,655 to $389,320.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

DESIGNS FOR COTTON AND MIXED FABRICS.

BY J. W.

Fig. 1 is a cloth that is selling well at present for shirtings, blouse cloths and costumes for domestics. It is well brought out in various shades of green, brown and blue. Fig. 2 is the full design and drafting for the heddles. The solid squares show where colored threads must be placed. Fig. 3 is the dobby plan. The particulars for manufacture are: 32 dents per inch in the reed, 20s and 40s warp Egyptian, 40 picks per inch of 10s for the filling. The threads weaving matt are for the 20s, and those weaving plain for the 40s, which must be placed on a separate beam so as to regulate the tension.

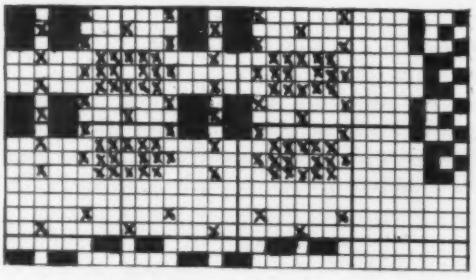


FIG. 2. FIG. 3.

Fig. 4 is a new style of mercerized stripe which is being made at present for dress goods. The colors of mercerized yarn must be of a delicate character such as cream,

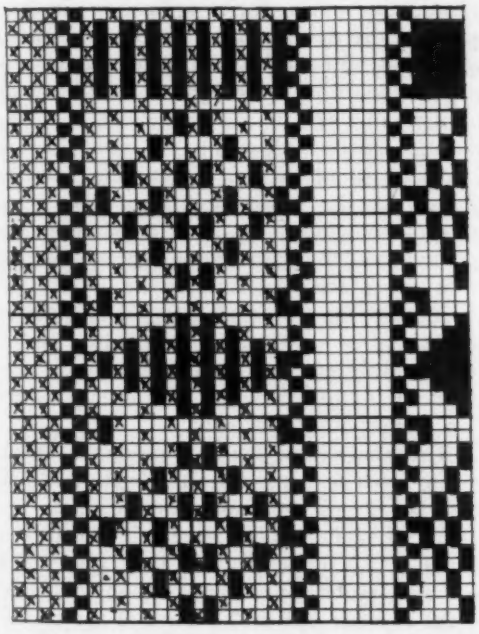


FIG. 8. FIG. 9.

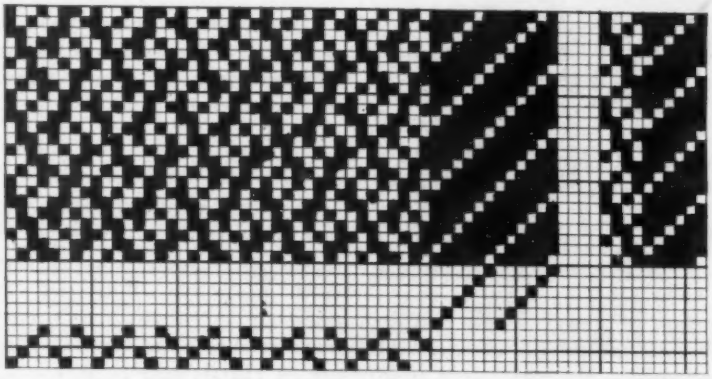
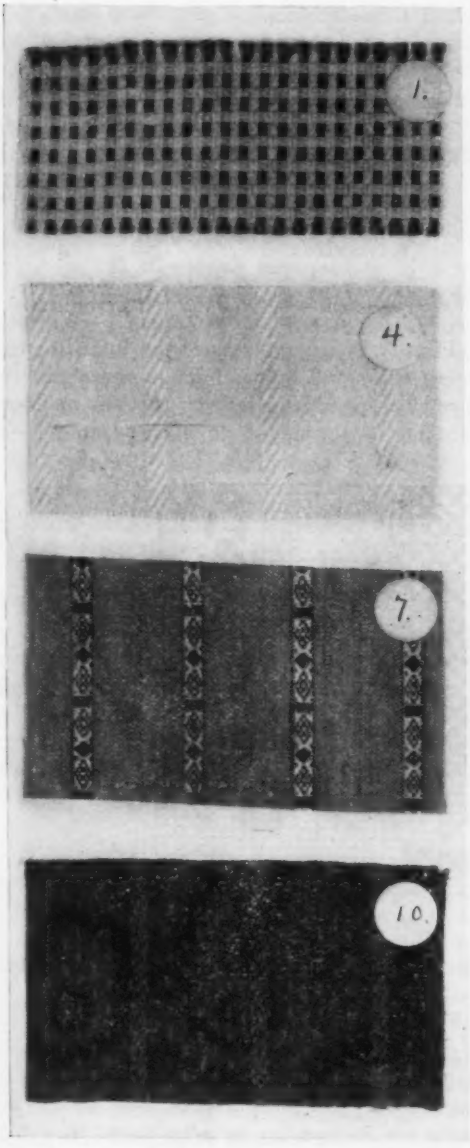


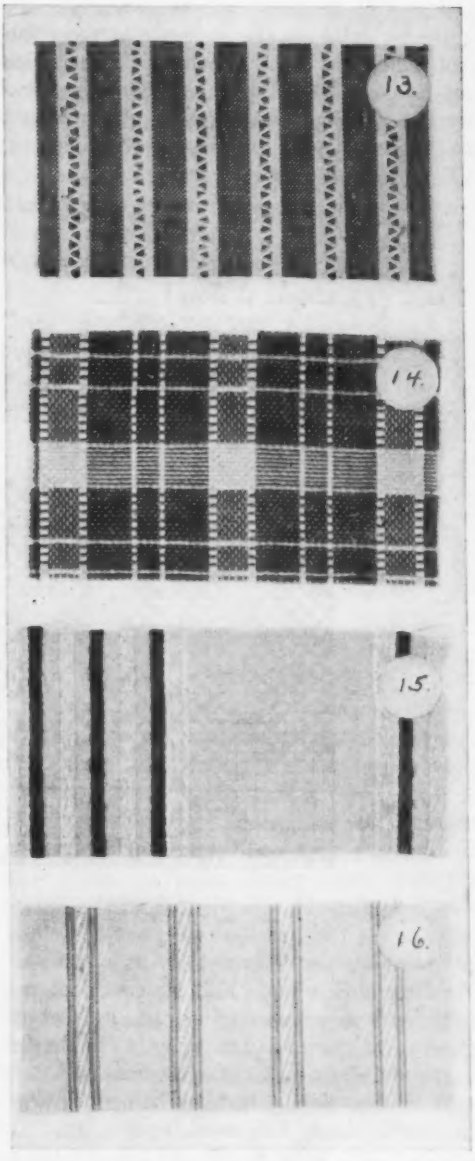
FIG. 5. FIG. 6.

primrose, lavender, light blue and light green. In some cases a slight nap is raised on the back of the cloth. Fig. 5 is the full design; the drafting for the harness is given at the bottom. Fig. 6 is the dobby plan, 10 heddles being required. The particulars for manufacture are: 32 dents per inch in reed, 20s and 2/40s mercerized yarns, for warp, 66 picks per inch of 16s.

Warping pattern:



FIGS. 1, 4, 7 AND 10.



FIGS. 13, 14, 15 AND 16.

40	Threads, White, 20s..... =	20	dents
12	" White Mer. 2/40s.. =	4	"
52	"	24	dents per pat.

Fig. 7 is a fancy dobby stripe of neat design suitable for various colorings. Fig. 8 is the design, the ground being repeated 11 times as shown. The ground or plain weave is shown by crosses and the dark color and figure by solid squares. Fig. 9 is the dobby plan, 6 heddles being required. The particulars for manufacture are: 40 dents per inch in reed, 32s Egyptian warp, 80 picks per inch, 32s American or Egyptian for the filling.

Warping pattern:

44	Threads,	Light Blue	= 22 dents
2	"	Black	= 1 "
1	"	White	= 4 "
1	"	DK Green Figure	
14	"	7 times as above	
2	"	Black	= 1 "
64	"		28 dents per pat.

White grounds with colored figure and stripe are exceedingly effective.

8	threads black	= 4 dents
3	threads buff	= 1 dent
4	threads black	= 2 dents
3	threads buff	= 1 dent
4	threads black	= 2 dents
3	threads buff	= 1 dent
4	threads black	= 2 dents
3	threads buff	= 1 dent
8	threads black	= 4 dents
9	threads light green mercerized	= 3 dents
56	threads	24 dents

Fig. 13 is a neat stripe, the main feature being the small doup effect in the center of the white produced by two threads of doup, crossing 6 threads blue in the same dent.

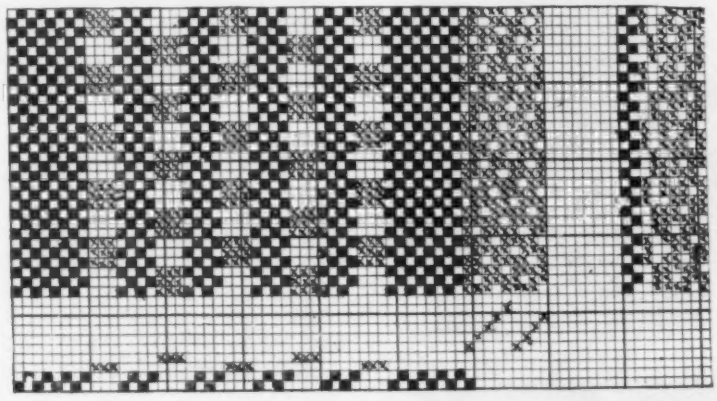


FIG. 11.

FIG. 12.

Fig. 10 is a mercerized stripe cloth suitable for winter wear. This style of design is going well in various colorings, it is cheap and easy to manufacture. Fig. 11 is the full design and drafting for the harness. Fig. 12 is the dobby plan, 9 heddles being required. The particulars for manufacture are: 32 dents per inch in reed, 40s and 2/32s mercerized for warp, 40 picks of 10s for the filling. The crosses on Fig. 11 show where the colors must be placed on back ground.

Warping pattern:

The dobby plan for the heddles will be 3 up 1 down for a top doup.

Fig. 14 is a mercerized check effect which is going well in dark colors. The weave is plain. There are various makes of this class coming forward at present from 24 to 40 dents per inch, 2/24 to 2/60 yarn, 36 to 64 picks of filling, same counts as warp.

Fig. 15 is a wool and silk mixture. The ground and filling are wool and the stripes silk. Various colorings are fashionable at present in this style. The ground weave is

plain and the stripes sateen, with a spot effect at the edges of the stripe. Small patterns are desirable, not over half an inch in width. There are various makes, all light in texture.

Fig. 16 is another style in cotton, silk and wool mixtures of a cheaper make. The ground and hair lines are cotton warp, silk stripe of white, and wool filling. Neat stripes such as the one given are mostly asked for. The ground weave is plain, and the silk stripe is an 8 thread twill weave.

ENGLISH NOTES.

(By Our Special Correspondent.)

In all departments other than cotton, the textile markets are exceptionally strong. Woolen, worsted and linen men have the most convincing evidences of the reality of a trade revival. Nearly every shed in Bradford is advertising for weavers and the worsted spinners are inconveniently short of young help. Anything in linen can be sold and there is the likelihood of a good summer sale in domestic trade for colored and fancy cottons. High prices are an obstacle in selling household cottons, for ordinary calico is 1 1/2 cents dearer, and heavy goods are as much as 9 cents a yard dearer than a year ago. A novel feature in the knit goods trade is the importation of American mufflers. "Bradley" and "Phoenix" mufflers—both from Wisconsin—are unquestionably selling well.

* * *

So far as can be ascertained, not one American wool buying or manufacturing firm has its own wool buying office in Bradford. The fact is curious, for Bradford is the chief market. Its wool shipments to the States are always large and last year were substantially $10,000,000. American buyers come over in numbers, but do not take up a residence here. Their principals are perhaps of the opinion that a buying agency would not pay. There are dealers who think differently and believe that Americans, unnecessarily, at times, put up prices against themselves. The arrival and appearance of the Americans in the market is in itself an encouragement to stiffness. Then the buyers come pretty well at the same time and with the same ideas and intentions and in years like the last they cause themselves a good deal of expense by their tactics. The argument is that by being on the spot, by "lying low" and picking up the parcels they fancy when these are cheap the requisite wool would be got for substantially less money. The contention applies with more force to the English than to the colonial wools of which so many are bought over Bradford. The argument is presented for what it is worth to consumers of these long, light combing wools.

* * *

To all appearance the attempt to organize a curtailment of hours in mills spinning Egyptian cotton has totally failed. The Federation mills using American sorts are still running 40 hours per week, and owners of nearly 5 million spindles are working only four days. The inducement to continue on the short hours' basis is as strong as ever, for profit is still absent. There are some who prophesy that conditions will be worse yet, but this is guesswork. A notice to reduce cotton wages in March is expected.

* * *

Woolen manufacturers have a saying that the carded trade is three years bad and three years good alternately and are now reckoning on a run of prosperity. They are accordingly faced in Yorkshire by demands from the picker room and card room men who have narrowed down their points to three. They ask for the abolition of overtime. In the triennial spells of activity men in some of the single-shift mills get no time for themselves. The mills run until 8 or 9 nightly. They ask further for a 55 1/2-hour week and 12 cents an hour ($6.66 weekly). Undoubtedly there are employers in America who would be glad to give men of equal skill this and more than this. There are manufacturers in Yorkshire who substantially meet these demands already, but there is no uniformity. Each little center has developed on its own lines, making goods that

differ from those of other countries and catering for slightly different markets. There are, according to the trade unions, men in Yorkshire picker and card rooms receiving only 7 to 9 cents hourly. Be this as it may, I have yet to come across the manager of American experience who does not agree that the skill and fidelity of Yorkshire woolen workers is under-remunerated. It is agreed that the men do not get enough out of life.

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Article 368 of the United States tariff is the one which doubles the normal duty on wools that have been sorted or increased in value by rejection of any part of the fleece. It is subject to a saving clause: "Provided, That skirted wools as imported in 1890 and prior thereto are hereby excepted." I have been asked what meaning Bradford wool dealers attach to that clause. The answer is that they are not students of the precise terminology of any tariff. The payment of duty, the rate of duty and all things thereto appertaining are regarded strictly as the customer's affair with which the dealer has no personal concern.

He offers wool skirted (at one price) or unskirted (at a lower price) at the buyer's option. Skirting consists principally of removing the short fiber from the fringe of the fleeces. In his own interest the seller takes care not to throw too much into the lower sorts, for which he will have to take considerably reduced prices. He knows what length of fiber the customer wants and rejects the proportion that falls below the minimum. To the best of the dealer's knowledge this is quite according to the American tariff law; but the law is one for which they have no responsibility. There are vague ideas extant such as that "The law cannot touch you if you don't remove all the low parts of the fleece." But the dealer goes by what he is told and make no profession of ability to pronounce with authority on a point outside his business.

• • •

Traders in British wools have been showing perturbation over the publication of wool prices. Except at year ends or in reporting public auctions the Yorkshire newspapers publish no prices either of raw wools or of tops. The abstention has some justification. Wool names have no exact and universal meaning and there is no one price for all wools bearing the same name. Five makers may quote you five prices, all different, for what each calls 60s tops. The farmer in the country seeing a price in print makes up his mind that he will obtain this for his wool, although the price does not actually relate to the sort he grows and is for skirted, or cased fleeces. The customer abroad, seeing the quotation, jumps to the probably erroneous conclusion that he paid far too much for his last delivery. The manufacturer on the spot does not count, for he knows market values and helps to make them. The regular newspapers have thus arrived at the opinion that quotations do less good than harm and when attempted it has always led to imputations upon their judgment or veracity. Prices, however, are being circulated in a subscriptiton circular and wool dealers are wroth.

• • •

Illustrating the indefinite value attaching to wool names I quote a spinner of crossbred qualities. A dealer who called at the mill and failed to do business on his samples remarked that he had a parcel of good 44s. He was sure it was good 44s, everybody called it 44s and as a remarkably reasonable price was asked for it the spinner ordered a sample. The dealer's "44s" was the spinner's 36s. So with wools and so with tops. The spinner gave up buying a 36s top and combed his own for three years. Hearing continually how much cheaper he could buy than make them he tried another purchase. They might well be cheaper to buy for they were of a different and inferior sort. To get as good a spin as three years ago he had to buy not 36s but 40s.

The debasement of quality numbers is due largely to the comparatively new practice of blending. Woolstaplers whose business is to sell wool substantially in condition as received are led occasionally to think that they

might get a better price for a lot if they combed it. Invariably they find themselves mistaken. To make tops to a profit you have to gain bulk by using skin wool and luster, color or whatever else you want by judicious admixture. Every now and then one hears of tops compounded of ten or a dozen or twenty sorts of wool. The mixture is an art only to be acquired by giving all one's time to it. Although there are top makers whose qualities are what they used to be, the general trend has been downward and more than one spinner has to buy a nominally higher sort in order to get results as formerly.

• • •

Hide and leather men in this country are addressing themselves to the Government on the subject of sheep marking reform. They wish farmers to put their identification marks upon the animal's head. Farmers regard that as a disfigurement and continue to brand their sheep on the back or side with a large initial printed in red or black tar. The waste of wool is enormous, for the marking compound resists the wash bowl. The tar marks have to be torn from the fleece and the locks thus created sell for only a fraction of their unmarked value. It has been recognized for a long while that the straight path of reform lay first in inventitng a soluble marking composition which would stand a winter's exposure on the hills; second, in inducing farmers to use it. The composition has been invented by a Bradford wool dealer in collaboration with a chemist and accounts of its behavior are all satisfactory. After serving the farmer for six months on the fleece the coloring is all cleared away in the third wash-bowl and the wool is no worse for its application. The owner is supplying sample cans to all comers who promise to test it.

• • •

It is forbidden now to call any blankets "Witney" except such as are made in that little Oxfordshire town. It is illegal, and men have been imprisoned for falsely applying the designations, "Irish linen," "Donegal" and "Harris" tweeds. For all that we continue to make "Axminsters" and "Wiltons" in Kidderminster; and "Kidderminsters" in Halifax; "Welsh" and "Yorkshire" flannels in Rochdale; "Ayrshire" blankets in Sowerby Bridge. The explanation is that some geographical names are not disproved to be common property and some have been. There is no question as yet of anybody's right to call a carpet "Brussels," for instance.

It is in London that prosecutions for real or alleged misrepresentation mostly originate. The London Chamber of Commerce, flushed with its success in reforming the trade in furs, turns now to wool goods. The Chamber wishes the Government to be much more severe on those who describe wool and cotton mixtures as "all wool." The London Chamber is to have the benefit of the observations of woolen manufacturers on this practice. According to one reading, anything is "all wool" or "all woolen" that is made entirely on woolen machinery. A cloth is "union" when it has woolen one way only—as when the fabric is woven on a bought cotton warp. As yet the reformers have not ventured on any exact definition of what they wish "all wool" to mean.

• • •

The usual disinclination to spin fine numbers has shown itself again now that orders for coarse worsted counts are plentiful. Spinners seek in vain for somebody to relieve them of the necessity of spinning 2/70s and curse the day they took the order. They want to be turning 24s and 32s out of a good quality and be earning money on the output. The spindles turn faster in fine spinning, but not so fast as to compensate the producer. A spinner of experience gives these speeds as being usual: Spinning 60s to 70s, 8/9,000 revolutions per minute; he has heard of nothing faster than 10,000. Spinning nothing higher himself than 363 out of qualities ranging up to 60s, he runs his own spindles at 3/4,000. I am told that some of the spinners of 2/12s and such like for the Leicester knit goods market run at 2/3,000. There would seem to be considerable variance of practice. It is claimed on responsible au-

thority that a highly reputed firm like D. Illingworth runs its spindles faster than any in Bradford. On the other hand Tankards, color spinners, make a virtue of the fact that their equally fine yarns are spun at a rate 30 per cent. slower than that used by the less careful commission spinners.

PRINCE SMITH & SON'S NEW PATENT O. P. S. GILL BOX.

BY JOHN BROWN.

When the late Lord Masham was experimenting in silk manufacture, one of his greatest difficulties was to make an even sliver which should be free from lumps. Ordinary gilling would not do this, but when his partner, Mr. Warburton of Addingham, invented the intersecting gill, he found he could make nearly as good a yarn out of hand dressed silk as he had previously done by combing it.

The intersecting gill may be best described as a box with two sets of fallers, one working over the other, the pins of the top

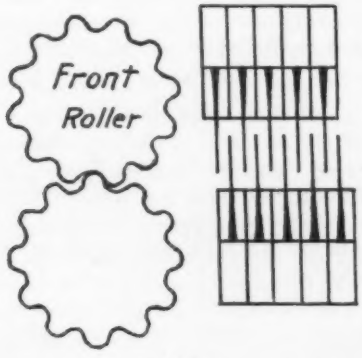


FIG. 1.

set pointing downwards, Fig. 1, and so arranged that the rows of top and bottom sets of faller pins intersect each other and thus keep a firmer hold on sliver passing through them, not only preventing any fibers slipping over the points of pins without being properly gilled, but also holding them in their position until close up to the nip of the drawing-off rollers.

The advantages of this method were never fully recognized by English combers, with the result that the intersecting gills never came into general use in this country. The Continental combers using principally the shorter growth of wools took full advantage of the invention, and by substituting fallers with one row of pins and using greater care in the general construction of the box, de-

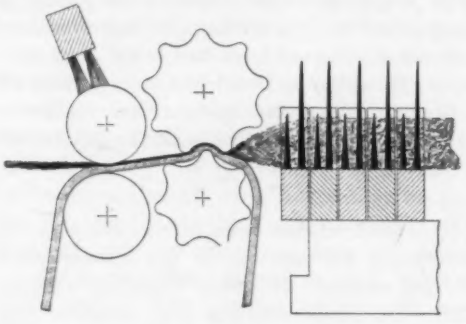


FIG. 1A.

rived so much benefit therefrom that the intersecting gill is in almost universal use by them today.

The substituting of a single row instead of a double row of pins increased the number of fallers used and also the relative speed of the screws, causing more wear and tear. The arrangement of fallers likewise does not permit any damage to pins being readily seen. In spite of these drawbacks, the advantage gained is so great that the short wool combers have generally adopted this style of gill both before and after combing.

The real principle achieved by the intersecting gill is the proper guidance of all the fibers in an even position to the closest point of the nip of the front roller, without allowing any individual fibers to rise in the pins or overlap their points.

The inventors of the O. P. S. gill box claim to achieve this in a much simpler, less costly, and more effective manner than is possible in the intersecting gill. In the O. P. S. gill box there are the ordinary fallers with two rows of pins. The front row is of the same size as those used in the intersecting gill and is composed of short, round pins, while the back row consists of pins

which are made flat for the sake of strength and which are practically double the length of the front row. The difference in length is more than equivalent to the thickness of the sliver when it is laid in the faller just before drawing off, Fig. 1a.

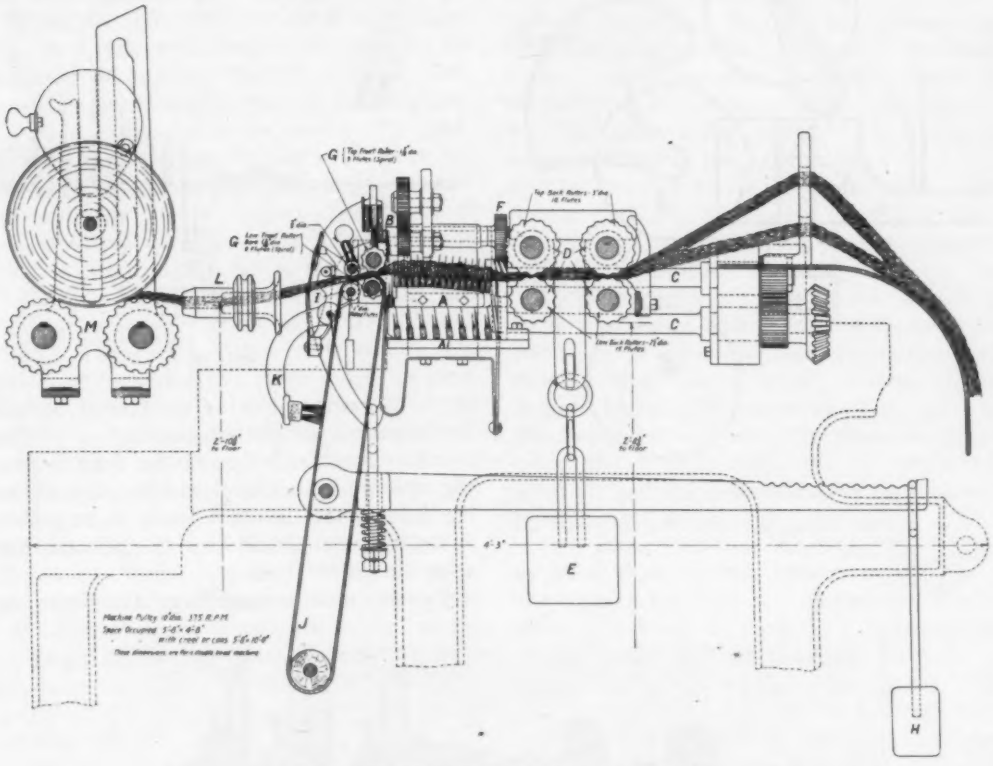


FIG. 2. SECTIONAL ELEVATION OF O. P. S. GILL BOX.

A. Top saddle—note incline on top side and step at delivery end.
A1. Bottom saddle.
B. Auxiliary cam for putting faller into position at 2a.
C. Screws for actuating fallers.
D. Back or feed rollers (2 pairs.)
E. Dead weight to ditto.
F. Spur wheel gearing screw (top) to auxiliary cam.
G. Spiral fluted front drawing off rollers.
H. Dead weight to ditto.
I. Smooth rollers carry leather nearly horizontal for a short distance from F. D. O. rollers.
J. Drawing endless leather or sheet.
K. Clearing brush on ditto.
L. Funnel.
M. Balling head.

The leading mechanical points of the O. P. S. gill box may be summarized as follows:

Stepped Saddle,
Auxiliary Cam,
Swell in Screw, thread nearest to Cam,
Inclined Saddle.

Fig. 2 is a sectional elevation of the box. A is the stepped saddle and shows the faller leaving its first position, and only leaving the sliver when the next faller has advanced partly over it. Instead of cutting the screw

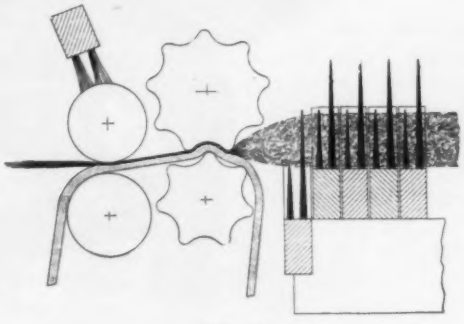


FIG. 2A.

in the ordinary way with but one gauge, the last thread before reaching the cam is differ-

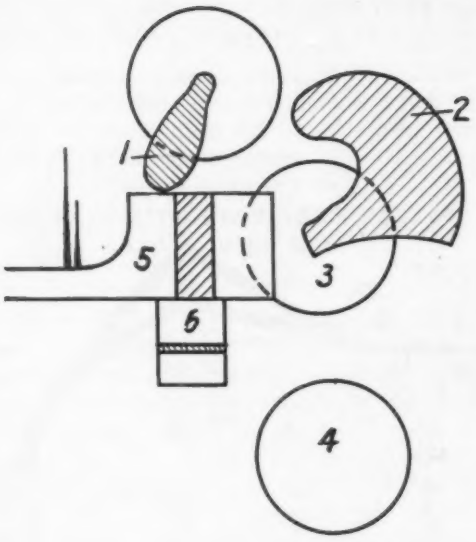


FIG. 3. SHOWING AUXILIARY CAM.

1. Auxiliary cam-putting faller to Fig. 2a.
2. Ordinary cam.
3. Top screw.
4. Bottom screw.
5. Faller.
6. Top saddle.

entiated. This increases the speed and brings the faller forward towards the front roller as soon as the preceding faller has

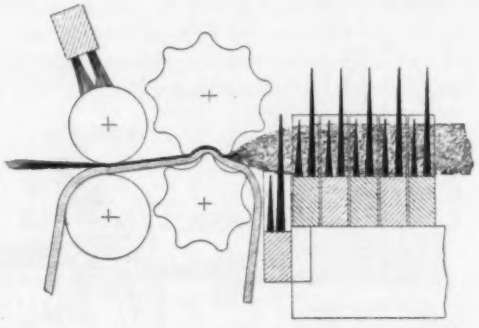


FIG. 3A.

left. Moreover it is accomplished without the slightest danger of pushing or ruffling the fibers, as at this point the draft is causing the wool to travel much quicker than the fallers. If the back ends of any fibers were pushed it would have the effect of creating knops or slubs.

By the new arrangement the fibers ap-

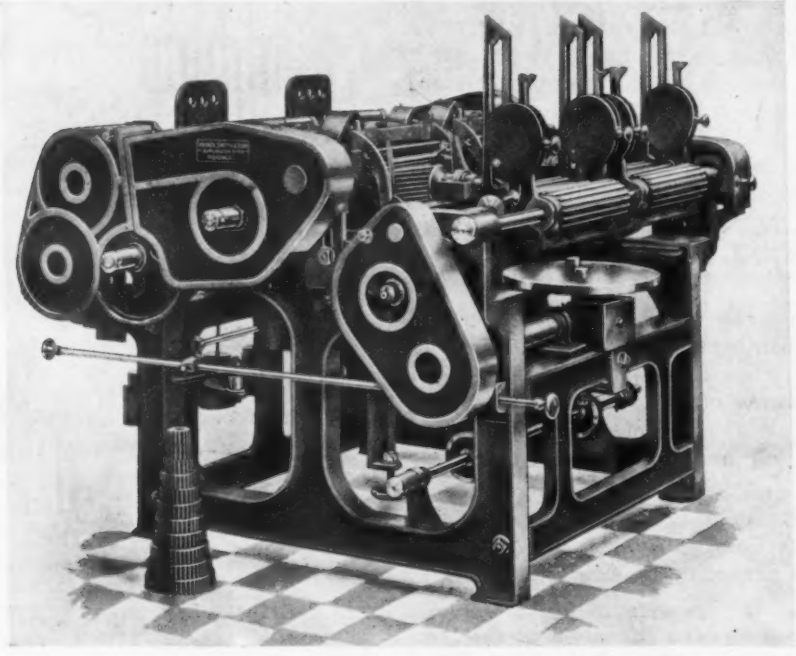


FIG. 4.

proaching the front roller are straightened and the possibility of the accumulation of waste is distinctly minimized.

When the faller reaches its first position, Fig. 1a, it is pressed down to the step on the saddle by an auxiliary cam, B, Fig. 2. This, as will be seen on reference to the diagram, is geared to the top screw shaft. It is positively driven and synchronizes with the ordinary cam and when once properly set, cannot easily get out of order. The action of this auxiliary cam puts the faller into the position seen at 2a. Here the second row of pins is still holding the fibers and is half the thickness of the faller nearer to the roller. The ordinary cam now comes into action and carries the faller from its position at 3a into the bottom screw. It will be noted that at this point the pins are as close to the roller as it is possible to get them.

Another advantage is that the fallers are thicker than those on the intersecting gill and less speed is consequently required. Moreover, there is considerably less wear and tear of the saddles and fallers than with the intersecting or indeed any other system. Through the perfect control which the faller has over the sliver, heavier loads and longer drafts may be used without detriment to the work done.

Fig. 3 is an end view of screw and cams.

Fig. 4 shows the O. P. S. gill box complete with 2 heads. The O. P. S. box is made with any number of heads running either direct to ball, or making broad lap from all the heads, for blending purposes. The lap is carried along the guide trough to the balling head set at right angles to the gills or to boilers. The writer is indebted to Messrs. P. Smith & Son for many of the illustrations accompanying this article.

The increasing centralization at Montreal of capital and control of great Canadian manufacturing industries is evident. The list shows 818,542 spindles and 19,324 looms in mills or branches of mills controlled in Montreal.

Canada imported from the United States over $6,000,000 worth of raw cotton last year.

MATCHED WOOL AT THE LONDON SALES.

BY ARTEMUS ARGUS.

A correspondent requests my attention to a case of alleged false pretences in the wool trade. According to a statement which I neither deny nor affirm a lot of South American wool after being "matched" in Bradford was forwarded to the London wool sales and sold to America as Australian produce. He thinks that on admission to the United States, this lot should have been charged with double duty.

A reference to Art. 368 of the American tariff law shows that wool "changed in its condition or character for the purpose of evading duty"; and wool "sorted or increased in value by rejection of any part of the fleece" is—on one condition—liable to twice the normal duty. It is "Provided: That skirted wools as imported in 1890 and prior thereto are hereby excepted."

Is it contended that this wool was treated in other than the pre-1890 manner? Or is the opinion based on the alleged deceit practiced in calling Argentine wool Australian? In the latter case let reference be made to 19079 in the "Synopsis of Decisions." In this communication, made in response to a complaint by an Argentine wool shipper, Secretary Lyman J. Gage writes: "No discrimination is made in favor of Australian wool. . . . The dutiable classification of both, Argentine and Australian, being dependent upon whether the same are skirted or sorted or handled in a different manner than 'in 1890 and prior thereto.'"

This makes it clear that the only possible ground for doubling the duty would lie in the character of the sorting or manipulation and as to which no evidence is tendered. Presumably nobody in the trade needs telling that large quantities of "matched" or "cased" fleeces are sold direct to America from Bradford. Sometimes they have been packed in specially imported tares stencilled boldly "Australian produce," but this method of operation is not approved by wool brokers in general who feel that it is seriously to their own disadvantage to procure for Australian wool a bad or even a dubious name.

The facts in this particular case may be as stated because there are a limited number of South American wools that could be dressed up to look like Australian, and the self-interest of brokers with extensive Australian connections would certainly cause them to discountenance any similar proceedings. What would Sydney newspapers and brokers say if they were able to show that reputable London houses were lending themselves to false practices? In the wool trade, as in all

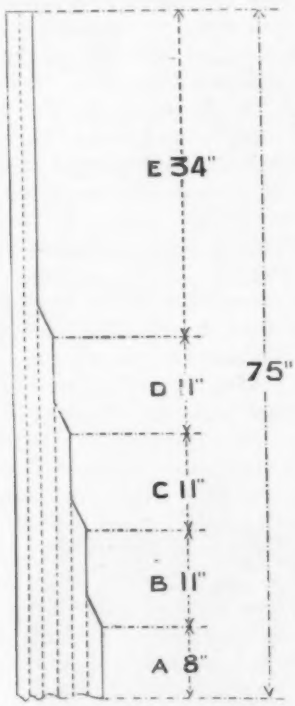


FIG. 14.

trades, one can say that everything—honest or dishonest—is either done or attempted. But buyers on the whole know just as much, or more, about wool as sellers do and the extent to which they can be deceived is very limited. While it is never possible to say that no one dodge is attempted, it is possible to make fairly sure that the dodge is not being worked on any vast scale. The wool business is public. One man knows fairly well what another is doing and my inquiries do not suggest that any instances of this kind is anything more than casual. If the buyer of this lot has been hurt he will be careful not to have any more. If the customs have been hurt it must be because of the handling to which the wool has been subjected, not because of the deceit as to origin.

CARD GRINDING.

(From the Grinding and Mounting of Card Clothing recently published by Dronsfield Bros., Ltd., Oldham, England.)

(Continued from January.)

While the cylinders and doffers are stripped, they should be tested to find this irregularity; in the case of old cards, the cylinders should be ground in all cases in order to grind out the "burrs" caused by the constant rubbing of the teeth-crowns, so that the new filleting will "bed" itself bet-

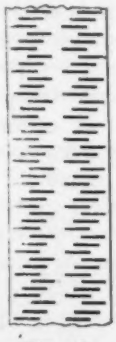


FIG. 15.

ter. The test of irregularity should be performed while the cylinder is running at quick speed. A good straight edge for the chalk test may be had in the tube of a traversing wheel grinder, which should be mounted in the grinding steps. By this means it will be easy to discover the truth or otherwise of the cylinder and doffer, not only circumferentially but laterally.

The truing up of cylinders and doffers is accomplished by the patent bare cylinder grinder, Fig. 10. This grinder is specially constructed for the work, and is very substantial in all its parts. Many practical carders have known and recognized for years the importance of the point under consideration, and, previous to the invention of the special grinder, having no better

appliance, made use of the ordinary emery wheel grinder used for card grinding. Many of these were spoiled in this way, as they were never intended for heavy grinding of the type demanded in truing up bare cylinder surfaces. The bare cylinder grinder here illustrated is built on the traverse wheel principle. The wheel is of consolidated corundum, and is mounted upon a strong

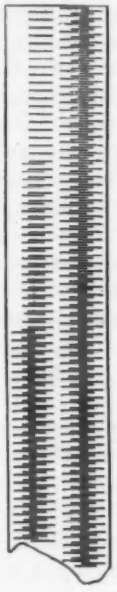


FIG. 16.

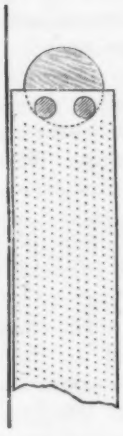


FIG. 17.

tube, upon which it is traversed from end to end by means of a fork attachment with a double-way screw; this screw is placed side by side with the tube instead of inside as in the ordinary emery wheel card grinder, keeping the tube intact save for the key way. Dispensing with the open slot renders the tube very stiff and proof against any liability to deflect under the grinding pressure. Upon the tube ends are mounted two eccentric testing rings, which are used when setting the grinder in position on the frame sides of the carding machine; the rings at each end are turned round until they touch the cylinder, while the emery wheel touches at the center. The bed carrying the grinder and traversing mechanism is then bolted down in position, the setting motion wheels serving to put the grinder into closer contact as the irregularity is ground away. The pulleys shown are fixed to the cylinder shaft; the large pulley is employed to drive the grinder at a quick speed, the smaller one fastened to it drives the screw and gives the traversing motion.

Now comes the process of mounting the filleting in position on the various carding organs, cylinders, doffers, rollers, clearers, and the accessory card covered appliances, the stripping and burnishing rollers. It is the custom to send the clothing of revolving flats to the card maker or the machinist, except in isolated cases where the expense of transport is prohibitive and would entail much loss of time and production. In the latter case the mill is provided with the necessary appliances, but great care has to be exercised in their manipulation, and to the uninitiated it is by far the wiser plan to have this work done by the expert if at all practicable.

We will take the clothing of cylinders and doffers first. We have gone pretty thoroughly into the matter from a practical point of view, as we are certain that many of the evils arising in the form of bad carding, cloudy slivers, broken selvages, etc., may be traced to faulty mounting of card filleting. It is essential that cylinders and doffers should be clothed in such a manner that the card filleting will not slip or blister through changes of temperature and atmosphere, working strain or other causes. This can be prevented only by mounting the filleting mechanically with an equal tension which permits of no variation. The card mounting machine with tension apparatus and indicator, Fig. 11, is now in general use, and is the recognized medium for clothing cylinders, doffers, etc. Previous to the introduction of this machine the clothing was done manually by the card nailers, but a little reflection will show that there must have been a great deal of guess work and rule-of-thumb method in the operation. Such a thing as regular tension was impossible. The work on the whole was laborious, and

although well performed in so far as the result was possible from manual labor, it could not be compared with the mechanical wrapping of today.

A short description of the card mounting machine will be helpful in enabling the reader to follow the directions hereafter given on the practical manipulation of the filleting. The machine consists of a double-purchase jack, U, which is used for turning the cylinder or doffer; a slide or bed into which is fitted a long screw, which receives its motion from the jack through the chain gearing; and lastly, the actual tension apparatus, which is mounted to slide upon the bed; this apparatus receives its motion from the screw through the traverse wheel. When preparing to clothe, the bed is bolted on to the frame sides of the carding engine and the jack fastened upon the shaft of the particular organ intended to cover, cylinder or doffer; bushes are supplied to make up the bore of the jack to fit the varying diameter of shafts.

It is usual to clothe first the cylinder of revolving flat and single roller cards. To accomplish this, the doffer is removed. When clothing double roller and clearer cards, the back cylinder is clothed from the back of the card; the slow tumner, front cylinder and doffer from the front. To clothe the tumner it will be necessary to mount a shaft or bar over the front cylinder in order to bridge the latter.

The widths of filleting in general use are 2 inches for cylinders, 1 1/2 inches for doffers. In using the mounting machine the traverse of the tension head must correspond to the width employed. If a 2-inch filleting is being mounted, the head will have to advance two inches for every revolution of the cylinder. For this purpose, change wheels are supplied with the jack; these change wheels, which at one time were loose, and had the knack of being lost when wanted, are now fixed on the jack, and the latter has been so altered that the chain wheels employed in the screw drive give the necessary traverse. These chain change wheels are side by side, and when changing the width of filleting it is only necessary to pass the chain on to the right wheel without any detachment being necessary. The jack possesses also a patent die fastener, which automatically increases its hold upon the shaft as the tension upon the fillet is increased. This single die has replaced the old system of fastening with four, sometimes six, set screws.

The tension is secured by the tension apparatus, Fig. 12. The filleting is passed through the trough, D, then wound over a three-coned pulley passing from one cone to the next over curved plates. Each cone is larger than the preceding one, and the largest is covered with leather. From the latter the fillet passes over the lever, E, to the cylinder being clothed, in correct position for lapping; this lever actuates the finger, which indicates the exact tension put upon the filleting. The tension is gained in three ways. First, the coned pulley gives 50 lbs. tension on the back of the fillet foundation and not upon the teeth. Second, a variable brake on the shaft of the coned pulley causes the fillet to be drawn over the latter at a quicker speed than the coned pulley itself is permitted to revolve; this again creates "back" tension, the amount of which may be placed at 100 lbs. Thus there is a tension of about 150 lbs. gained without having to resort to pressure upon the card teeth. Third, the remainder of the tension required may now be obtained by screwing down the weight plate in the feed box, D. The tension indicator, H, is divided and figured, the finger indicating very clearly the amount of tension applied upon the filleting.

Before beginning to wrap the filleting, all the wood plugs should be carefully examined to see that none are loose, and the edges of the cylinder chalked off to indicate the rows of plugs, as a guide for the nailing process after the cylinder is clothed. The filleting should be opened out loosely but regularly in a skip, and should stand thus for some three or four hours in the card room previous to clothing, in order that it may attain the corresponding temperature.

The best means of wrapping a cylinder or doffer, and that in general vogue at the present time, is the so-called "inside tail-end" system, which permits of full and unbroken selvages with an even circle or row of teeth at the extreme edges of the cylinder and doffer. The immediate result of such a method is an improved full edged sliver.

We will suppose the cylinder to be 50 inches diameter, to be covered with 8-ribbed filleting 2 inches wide. The doffer to be 24 inches diameter, to be covered with 6-ribbed filleting, 1 1/2 inches wide. Circumference of cylinder, approximately 157 inches. Circumference of doffer, approximately 75 inches.

It is first necessary to obtain the length for one lap, and this is done by simply tacking the end of the fillet to a plug, and passing round the cylinder with the fillet drawn tight until the starting point is reached.

(To be continued.)

DRAFT AS APPLIED TO COTTON. YARN PREPARATION MACHINERY.

BY BOLSTER.

(Continued from August.)

CARD DRAFT AND DRAFT CONSTANT.

The draft constant of a card may be found by applying the general rule given for draft, assuming the draft gear to have one tooth, or omitting it as follows. Referring to Fig. 4:

48 × 120 × 40 × 214 × 27 × 18 × 2 inch ÷ 17 × C. G. × 45 × 21 × 17 × 18 × 6 inch = 1624.8 draft constant.

To find draft with a given draft gear divide constant by gear.

Example: What would be the draft with a 20 draft gear?

1624.8 ÷ 20 = 81.24 draft.

To find what gear will be needed to obtain a given draft. Divide constant by draft required:

Example: What gear would give a draft of 108.3?

1624.8 ÷ 108.3 = 15 gear.

It is not always convenient to find the size of all gears, etc., therefore the following method of finding the draft constant is often resorted to, viz:

To find the draft of card from weight of lap and sliver.

A carder can easily ascertain the weight of sliver that is being made and the weight of the lap fed on a card. It is easy to find the number of teeth in the draft gear, which is the small gear which meshes into the large gear on feed roll.

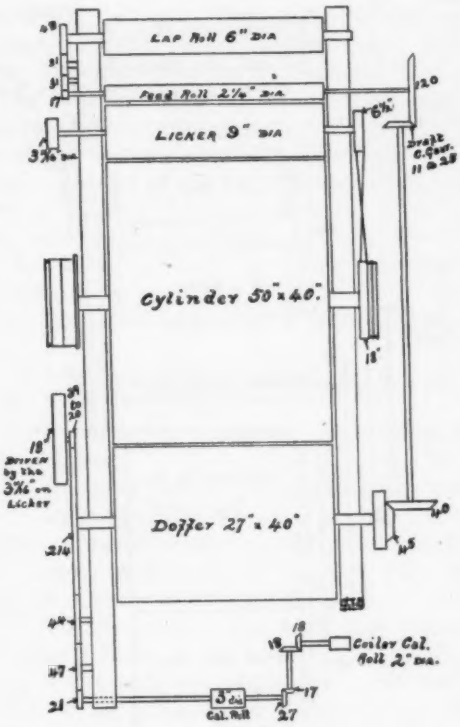


FIG. 4.

ARRANGEMENT OF GEARING ON CARD.

To further illustrate this, let us assume that a card is being fed with a lap weighing 12 ounces per yard, and is delivering a sliver of 60 grains per yard with a draft gear of 20 teeth. Then the number of grains in one yard of the lap would be:

437½ (grains per oz.) × 12 = 5250.

5250 (grains fed) ÷ 60 (grains delivered) = 87.5 draft, with allowance for waste.

To find the draft constant, multiply the draft by the draft gear being used, thus:

87½ × 20 = 1750, draft constant.

This constant is used are those found by the gears.

Draft and draft gears may also be found by proportion. When it is necessary to change the weight per yard of sliver made on the card, this method is used. When a change is made in the weight per yard delivered, it is necessary to change the draft, providing a corresponding change has not been made in the weight per yard fed, and, therefore, a different size draft gear must be used.

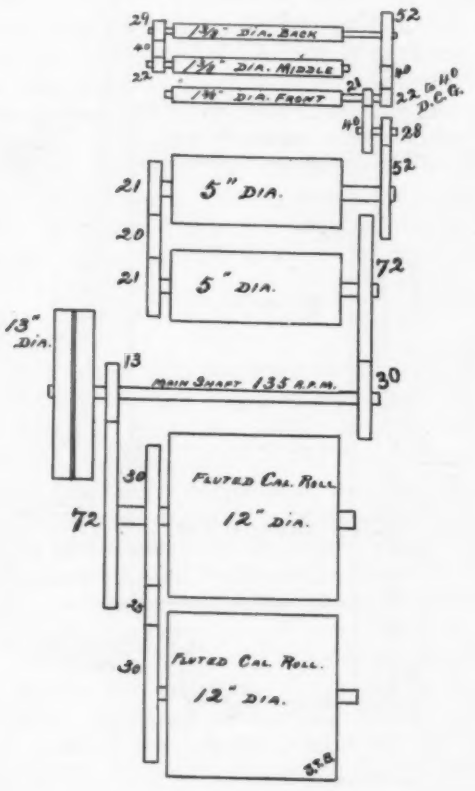


FIG. 5.

To find draft gear when changing the weight of the sliver:

Multiply gear on by weight per yard required and divide by weight being made.

Example: If a 50 grain sliver is being made with a 25 tooth gear, what gear would be needed for a 60 grain sliver? Then:

60 × 25 ÷ 50 = 30, gear.

On a card there are three tension drafts and one main draft as will be shown.

The first tension draft is between the lap roll and feed roll and by applying the rule given we obtain

48 × 2¼ ÷ 17 × 6 = 1.0588 draft at this point.

If too much draft is introduced here the sheet will be torn. In some cases no draft is used at this point and the lap roll is geared so that it revolves at the same surface speed as the feed roll, therefore the tension depends entirely upon the slippage of the lap on the lap roll. This, however, on modern cards is provided against by having large flutes in the lap roll to prevent slippage as far as possible, because when the tension is depending entirely on slippage it is possible for the lap to be strained and the work run uneven by the slippage being too great; therefore it is better to have a more positive drive on the lap and introduce a little draft, as shown in above calculation.

The second draft on the card between feed rolls to doffer is the main or break-draft; this is the draft that is changed whenever a change is made in the weight per yard of the sliver, and in calculating the draft at this point we will use a 20-draft gear. This gear drives the feed roll from the doffer and any change in its size will change the ratio of speed between these two points.

Using the above gears and adding ¾ of an inch to diameter of doffer to allow for clothing we obtain the following draft:

120 × 40 × 27¾ ÷ 20 × 45 × 2¼ = 65.78 between feed roll and doffer.

The second tension draft on this machine is between the doffer and doffer calender rolls, shown in Fig. 3 (see August, 1909), as 3 inches diameter.

This is also an important draft as too much between the doffer and these rolls may result in not only drawing the web unevenly, but in actually breaking or tearing it. On the other hand if not enough draft is used the web will sag between the doffer and the

rolls, and if allowed to run may collect in bunches, or the web may gain enough on the calender rolls to break down the sliver, this being especially the case in a very damp atmosphere or where the doffer comb is set close and low.

The gears shown will give a reasonable draft at this point, which is as follows:

214 × 3 ÷ 21 × 27¾ = 1.101 draft between doffer and 3-inch calender roll.

The ¾ is added again to doffer for clothing and the 44 and 47 gears are simply carriers and are omitted in the calculation.

The last draft, which is the third tension draft, is between the doffer calender rolls and the coiler calender rolls and is equal to

27 × 18 × 2 inch ÷ 17 × 18 × 3 inch = 1.0588.

This draft may also be too great or too small. With the latter it will allow the sliver to hang in front of the doffer calender rolls, while with the former the sliver will be strained, although its injurious effect will not be so readily detected as would the same error between the doffer and doffer calender rolls. An experienced carder, however, can judge fairly well the correct draft at this point by breaking the sliver and before feeding it to the coiler again, allowing a small amount to run slack in front of machine and then noting the length of time taken by the coiler calender rolls to take up the slack after it is fed to them.

The total draft of this machine may be found either by gears or by multiplying the above drafts together. For example:

1.0588 × 65.78 × 1.101 × 1.0588 = 81.2 total draft.

Or by gears using a 20-draft gear we obtain the following:

48 × 120 × 40 × 214 × 27 × 18 × 2 ÷ 17 × 20 × 45 × 21 × 17 × 18 × 6 = 81.2 total draft.

SLIVER LAPPER.

This is the first of the three extra processes used in producing combed yarns, and is the stage at which the slivers from either cards or drawframe can be returned into the form of a small lap to be used either on the ribbon lapper or comber.

There are usually three pairs of drawing rolls in a sliver lapper and these may be of the common or metallic types, or a combination of the two. Several times I have run a combination of metallic and common rolls on draw frames, sliver lappers, and ribbon lappers, and obtained satisfactory results.

At the present time four pairs of rolls are being tried on sliver lap machines that are intended to supply laps direct to the comber, without the aid of the ribbon lapper.

The gearing diagram shown in Fig. 5 represents the general arrangement for almost all makes of sliver lappers, although the size of the gears vary slightly according to the required draft, which on this machine is usually between 1½ and 2¾.

The gearing shown is for common rolls, and by applying the general rule for draft we obtain the following with a 22 draft gear.

52 × 21 × 28 × 21 × 72 × 13 × 12 inch ÷ 22 × 40 × 52 × 21 × 30 × 72 × 1⅜ inch = 2.51 total draft.

The above may be divided into four intermediate drafts as follows:

(1) Between back and middle drawing rolls.

(2) Between middle and front drawing rolls.

(3) Between front drawing roll and small calender rolls.

(4) Between small calender rolls and fluted calender rolls.

The drawing rolls are the reducing or attenuating stage and the calender rolls introduce merely a tension draft.

The draft between the back and middle drawing rolls is:

29 × 1⅜ inch ÷ 22 × 1⅜ = 1.318 draft.

The draft between the front and middle drawing rolls is the break draft and is changed by a change in the size of the draft gear; assuming this to contain 22 teeth the intermediate draft at this point will be:

22 × 52 × 1⅜ ÷ 29 × 22 × 1⅜ = 1.8 draft.

The next draft, viz, between drawing rolls and smooth or small calender rolls is merely a tension draft, as will be seen from the following:

21 × 28 × 5 inch ÷ 40 × 52 × 1⅜ = 1.028 draft.

(To be continued.)

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

Cotton Velvets.

Editor Textile World Record:

Please give a brief description of how velveteens are dyed and finished in the piece. Can these goods be dyed on jiggers and squeezed after rinsing without injury to the pile?

Nelson (1151).

We have referred this question to our French correspondent who writes as follows:

After the velveteen has been cut either by hand or by machine it is subjected to the following operations:

Boiling off. This removes the sizing on the warp and the gum on the back of the goods.

Brushing. The pile is untwisted and raised by brushing lengthways and crossways while the cloth is damp.

Singeing. To make the pile of uniform length, the piece is passed rapidly over plates heated to a red heat.

Washing. This is to remove the dust left in the goods after singeing.

Brushing. The piece is again brushed both ways.

Singeing. The singeing process as already described is repeated.

Boiling off. The goods are washed and dried.

All these operations are previous to the dyeing, which varies according as the color is to be black or not. By passing through the foulard or jiggger a bottom is imparted to the black by oxidation. After dyeing in the foulard or jigger a bottom is imparted washed and dried on the cylinder. The goods are then steamed in order to raise the pile that has been pressed down during the drying process. The cloth is then brushed, next sheared, and then glued with a solution of Prussian blue and linseed oil dissolved in benzine. This solution is made to penetrate the pile by the action of a roller covered with felt. The velveteen is then dried for several days in a chamber at a moderate temperature. Next comes a light brushing, then a shearing, after which the cloth is passed between wooden rollers in a finishing machine. For other shades the process of mordanting and dyeing are always followed by washing and drying. In finishing the goods are treated on the back with a solution of starch. After drying the cloth is run through a breaker to soften the fabric. It is then lustered by two passages through a machine which applies spermaceti to the pile. Next comes brushing and shearing. The final process is the brushing of the pile. The face or pile side of the cloth passes very slowly over a steel plate while the back of the cloth is subjected to the action of a very heavy cylinder covered with felt and turning rapidly. Gaul.

Speed of Card.

Editor Textile World Record:

I would like to have you inform me as to the speed at which a card should run on coarse territory wool in the manufacture of flannels.

Canton (1152).

In manufacturing flannels the main cylinders should run about 90 revolutions per minute. It would be much better to run all three main cylinders at 70 revolutions per minute. The tubes should run faster on coarse stock and in some cases it is necessary to have a tube made especially for coarse stock. The first and second breaker doffers should be run about 15 revolutions per minute. But the tube on the second

doffer should be run slower. The finisher doffers are seldom run more than 20 revolutions per minute. A double apron on the condenser is necessary for good work. The condenser should run about 350 strokes a minute. The aprons should be oiled frequently to keep them soft, as in this condition they will do the most rubbing. The best oil for this stock is good lard oil. Mixing soap with oil for wool is bad, for it will fill the wire full in a short time and very little carding can be done. The mule should be speeded low or the spindles may be speeded down and leave the rest of the mule running at the usual speed. Otherwise the coarse fibers will catch together and break the ends. Lytton.

Defects in Cotton Yarn.

Editor Textile World Record:

We would like to get your expert's advice on a cotton problem which has been troubling us for some time. The yarn concerned is 20s, 25s, 30s and 36s, wound on tubes 5 inches long, Louisiana staple. We have used this quality for over ten years past without ever encountering the trouble mentioned hereafter.

Some two months ago we suggested to the spinners from whom we bought the yarn to use 6-inch cops, with the result that the goods came from the looms full of broken picks caused by weak places such as you will find on the cops which we are sending to you. Reducing the tension on shuttles to practically no tension, reducing the speed of looms, softening of picks, wetting of yarn, resulted in practically no improvement, as we found the yarn so weak in places that it fell apart.

Our subsequent claim on the spinners was not received in good grace, as they claim that the mispicks in the goods were caused entirely by faulty manipulation in weaving. We have no looms running faster than 160 picks on 40-inch goods and none faster than 145 picks on 60-inch goods. We believe that this defect is to be laid at the spinners' door, and it is with this point in view that we would like to obtain an expert's opinion as to the cause and remedy for the weak places.

Holbrook (1156).

On examining the yarn carefully, the first thing noticeable is the extremely soft twist with which the yarn is spun. Although this may be one of the particular requirements, it certainly would be improved if a little more twist was introduced. Giving a direct answer to the question as to whether the fault is in the spinning or the weaving, I may say that if this is a fair sample of the general quality of all the yarn supplied, that a good deal of the trouble referred to is due to the yarn.

A very prominent defect in the yarn submitted is the number of places where the thread is apparently strained almost to the point of separation, so much so that it almost falls apart when wound off the cop and allowed simply to support its own weight. Then by exerting the slightest tension the fibers draw out from each other, instead of breaking with a slight snap. While the causes for making cut or strained yarn in either the "mule" or "ring" threads are very numerous, it would appear that the defect in this case is partly due to the fact that in trying to get a very hard cop, the tension applied has been too much for the amount of twist in the yarn; in such a case the defect thus made is hidden until the yarn comes to the next process, when it yields to the slightest tension. While there are a number of causes for the defect on the mule, it is probable that, since the defective yarn has been received only since the change to a 6-inch cop was made, the trouble may be due to improper adjustment of the "fallers" and "quadrant" to the new length of cop.

Bolster.

Stamping Fast Black.

Editor Textile World Record:

Is there any material on the market for stamping fast black on cotton goods? I am enclosing a sample top of a white foot half hose which has a small white stripe around it. This white stripe is a great objection and we wish to find means for stamping it black, the same as leg. We thought probably the fluid used by print works would answer the purpose, but have no means of finding out how to apply the same. We would appreciate it very much if you could give us any information on this subject. Cadwell (1124).

There is no such material on the market which would give satisfactory results. All manufacturers have had the same trouble "Huron" has, and most of them have found it necessary to make the goods in the black without the stripe. This method requires picking on in the black which causes considerable dissatisfaction among the pick-on girls. This, however, seems to be the only practical way of manufacturing these goods without the stripe. A device has recently been patented for dyeing this class of goods,

by which the ribbed top and leg are dyed while the foot remains white. This system was recently given considerable space in the Textile World Record. While the method may not seem entirely practical, yet it probably is more feasible than the use of stamping fluid, as suggested by "Huron." It might prove to his advantage to investigate the new process. Merrill.

A Silk Throwing Mill.

Editor Textile World Record:

I would like information and advice about starting a new throwing silk mill plant. Will a capital of $6,000 be sufficient for a small sized plant, working on commission? Throwster (1141).

To give an intelligent reply to this question certain information is needed. We will have to make certain assumptions as a basis to work on. These are: that your correspondent will be his own manager and superintendent; that he will rent his premises and power; that he will pay for his machinery and equipment outright; that he will locate where plenty of skilled help is available; that he can get all the work at full price that he may need; and that he can get banking accommodation to the extent of 50 per cent. of the value of his machinery. The profitableness of a throwing business depends very much upon the continuity of work, but the percentage of standing machinery, during a period of years, is generally so great that what on its face may appear to be a large and certain profit, too often shrinks into one of most meager proportions.

In throwing organzine, owing to the great amount of the twisting, it is generally necessary to run the spinning frame night and day. The price obtainable for the work should average about 65 cents a pound for 2-thread organzine of 13/15 denier size, with 16/14 turns, and 35 cents a pound for 4-thread tram, of 13/15 denier size, with 3 turns of twist. The waste made, which is sold by the throwster for his own benefit, as a by-product, brings 50 to 60 cents a pound. This waste should average about 2 per cent. of the invoice weight of the silk handled, if the stock is good.

The experience of large and well managed throwing mills, with steady runs of work, is that organzine throwing, of the above kind (including in the figure interest and depreciation), costs from about 45 to 55 cents a pound, and that tram throwing, when run as a separate business, costs, for such work as is here specified, say from 26 to 31 cents a pound.

These are approximate figures, of course, and depend largely on the cost of the labor and of power. In the case we are considering it is evident that if skilled labor has to be paid for it will not be very cheap, and as the plant would be a small one the cost of the power and other charges would be relatively high.

Within the reasonable limits of a reply to the question it would be impossible to analyze all the details of these costs, but it will be safe to assume that, for organzine and tram of the average sizes referred to, the costs in such a case would not be below 55 and 30 cents respectively, and this, too, on the assumption of fairly steady running, and they might be higher.

Work done during each month can be charged up at the month's end and, in many cases, payment will be made within 15 days. Terms are net.

Suppose, now, that of the $6,000 available, $5,000 should be invested in machinery equipment, and supplies, and $1,000 held in reserve for contingencies—and contingencies are sure to arise. In addition to this it should be possible to borrow from a bank $2,000 or more, on the security of the machinery, which would serve to take care of pay rolls, rent, and other expenses until money was coming in freely enough to more than equal the outgo.

Without going into details, it may be stated that an organzine plant, of first class machinery and proper and complete equipment, and with spinning designed to run night and day, and capable of turning out about 1,200 pounds a month, can be procured for $5,000. This is a small output and to attain even this would require a full run of work and the driving of the machinery

to the limit, together with a good quality of raw silk.

The owner, therefore, would only get out of it the value of a foreman's salary—say $20 a week,—which he saves by doing that work himself, and 10 cents a pound profit on 1,200 pounds a month, together with 6 per cent. interest on his money, which is included in the cost. That is, if everything went without a hitch, he would make, between salary and profit, about $2,500 a year. It takes very little, though, to turn such a small profit into a loss.

A tram throwing plant could be bought for $5,000, including as before its necessary equipment and supplies. Such a plant should turn out about 3,000 pounds of 4-thread tram a month. This output, at a profit of 5 cents a pound, would yield $150 a month profit, being a little better than the figures on the organzine.

With such a limited business the owner must know his trade well and have everything else favorable if he expects to make even a fair living out of it. The chance of finding that his throwing is costing more than he can get for it is not by any means a remote one. James Chittick.

Wool Pitch.

Editor Textile World Record:

Please explain what wool pitch is and give some information regarding the process by which it is obtained from wool grease.

Palmer (1150).

Wool stearine pitch is the ultimate residium left in the still upon the destructive distillation of wool grease or degras. Wool grease containing from 25 per cent. to 35 per cent. of free fatty acid is subjected to fractional distillation, and the first results are the oleines, ranging in value from 98 per cent. down to 42 per cent. of saponifiable matter. Then come the stearines, the melting point ranging from 130° to 100° or less. Then come the distillates, with varying degrees of saponifiable value, and when all these matters have been run off there is left in the still a black residium which contains about 10 per cent. of grease and the cellular tissue or fleshy fiber out of which the oil has been distilled, together with the residium of mineral matter. This is wool pitch.

Southdown.

Price List for Looping.

Editor Textile World Record:

We are having a little controversy with our looper girls in regard to the price paid for 200-needle half hose looped on 20 and 22-point machines. There are no trimmers or ravelers on the machines. We offer them 9 cents per dozen with no deduction for bad work, but they claim that the large concerns pay 12 and 13 cents per dozen. One of them who formerly worked for a leading mill says they paid 12 1/2 cents per dozen. We have watched your Question and Answer Department for prices, but have never seen anything like the above figures. Looper (1138).

I have never heard of anyone paying over 9 cents a dozen for looping 200 needle goods in the white or grey. There are several mills in this vicinity that make this class of ladies' and men's hose and they pay 8 cents a dozen. There are some mills that pay as low as 7 cents and charge for all bad work. Mills in the South pay from 5 1/2 to 6 cents a dozen for looping and we still have to compete with them. We pay 3 1/4 cents for sizes 5 and 6, 3 1/2 cents for sizes 7 and 8, 3 3/4 cents for sizes 9 and 10. The sizes 9 and 10 are 128 needle and we get perfect work or charge for the imperfections. The girls make from $8 to $9 a week on 16 point machines and ravel their own work. I think that 9 cents is a good price for 200 needle hose in the grey and 10 1/2 cents in the colored. Watkins.

Price for Silk Half Hose.

Editor Textile World Record:

I am sending with this a sample of 200-needle half hose made from silk, and guaranteed absolutely pure silk yarn. We desire to learn what the jobbers pay for this quality of hose in black and tan, and also about what figure the large retailer is called upon to pay. We have a production of about 130 dozen of this grade per week and desire to make connections with one large retail establishment to take the entire production, hence we would like to learn something as to prices.

Warwick (1155).

A large jobber of hosiery to whom this inquiry was referred, writes as follows:

We have in stock a number of lines of silk half hose, but have nothing quite as light in

weight as this sample. In fact, it is my judgment, and also that of our retail people, that the fabric is too light for men's wear, and that while it might be heavy enough to make a ladies' stocking, we would not care to buy one so light in half hose.

We are paying $3.25 per dozen for one that is not made of as good quality of silk, but which is heavier. We also have one that looks to be about the same grade of stock, but heavier weight, that we are paying $3.-75 for and selling to retailers at $4.25.

Fillmore.

Uneven Shades in Dyeing.

Editor Textile World Record:

We are enclosing a sample of webbing knit from skein-dyed yarn, also a sample of the yarn before dyeing. We are having trouble by getting an uneven color, as you will notice. This yarn is dyed with Zambesi Black on a Klauder-Weldon skein-yarn machine. We are dyeing mercerized 2-ply and carded single yarns right along on this machine and have no trouble in getting even results, but always have trouble with 2-ply carded. Please advise us if possible where the trouble lies. Webster (1149).

I have always used Zambesi Black D on single and 2-ply carded yarns in Klauder Weldon skein yarn machine with good results. I have had trouble with other dyes giving uneven shades, same as sample, and usually found the trouble was due to the goods not having had a good preliminary boiling previous to adding the dye. The trouble may also arise from not diazotizing the yarn long enough. The yarn being 2-ply, it takes longer for the dye to penetrate the fiber. I have always had good results with the following process:

Give the yarn a good boil with 2 or 3 per cent. of Danker and Marston's bleaching assistant for one hour; run off and rinse; then fill the machine with water and add dye; bring to a boil and boil for one hour; run off dye and rinse in cold water until the yarn is cold and liquor nearly clear. Then diazotize for about half an hour, run off and give it a good wash. Develop with Beta Naphthol and caustic, running it three-quarters of an hour, and give the yarn another wash. Soften with olive oil and soap if desired.

Bigelow.

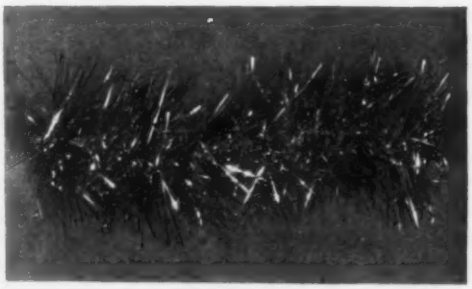
Machinery for Tinsel Chenille.

Editor Textile World Record:

Where can a machine for the manufacture of tinsel chenille be purchased.

Plymouth (1153).

The machinery required for the manufacture of tinsel chenille is built by the John Eppler's Machine Works, 629 Filbert St.,



TINSEL CHENILLE.

Philadelphia, Pa. These works turn out a line of machinery for millinery and dress trimmings, chenille machines for heavy rope portieres, paper cop tubes, shells and cones.

Hand Knitting Frame.

Editor Textile World Record:

We have in our mill an English hand knitting frame that is sometimes standing idle for months at a time. We have considerable trouble from the sinkers and needles rusting. What kind of grease is used on machines to prevent rusting, such, for instance, as is used on machines packed for transportation by European manufacturers?

Berkley (1150).

It is difficult to state what grease is put on English machines when packed for a salt water voyage, as almost every firm uses a different compound. The best preparation I know of is a mixture of tallow and whiting, but some firms use a compound of mineral residium grease with a certain amount of wool grease, while others use almost anything they can pick up which can be called grease. There has been a good deal of complaint lately on this side of the water on account of the grease arriving on some English machinery being so hard to clean off.

Southdown.

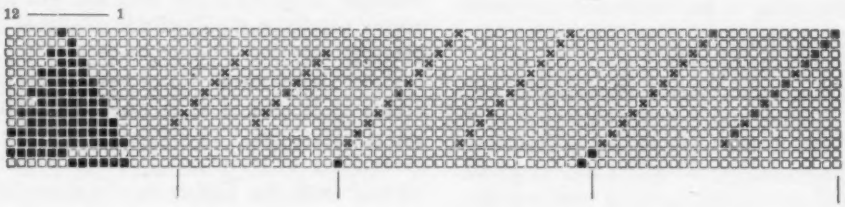
Weave for Six-Ply Cloth.

Editor Textile World Record:

Please give particulars for a 6-ply cloth.
Designer (1148).

The accompanying draft is for a 6-ply weave for hemp belting and is taken from Oelsner's Die Deutsche Webschule.

The first 16 threads of the drawing-in draft are for the selvage. The following layout for the belting is given by Oelsner and may be of interest: Warp, 664 ends for the ground weave and 53 ends for the binders, 3/8 hemp yarn drawn in on 12 ground and 2 binding harness. The take-up of the ground warp is 22 per cent. For 100 yards of ground warp 250 to 260 yards of binding warp is needed. The belting is finished 6 inches wide.



WEAVE FOR A 6-PLY CLOTH.

Bleaching Cotton.

Editor Textile World Record:

I am enclosing a sample of fiber taken from cotton-seed hulls. Please inform me if I can boil this with caustic soda and then bleach with chloride of lime. If so, what solutions should be used? After it is bleached where could I find a market for it? Oswego (1154).

Special machines would be required as this short fiber could not be bleached on the ordinary type machines for bleaching raw stock. In the washing process the loss in waste would be considerable unless some means could be devised for straining the water and saving the waste.

In bleaching goods like the sample submitted a solution of 1 to 2 per cent. of caustic soda based on the weight of the material is first prepared, the strength varying with the condition of the fiber. The goods are boiled in this solution for four to eight hours. After boiling the material is washed to free it from the boiling liquor before entering the chlorine bath. The chlorine bath could be from 1 to 2° Tw., leaving the goods in the bath until they are as white as required. The chlorine is then thoroughly washed out of the fiber. If the waste did not amount to too much I should think that this fiber could be used in the upholstering trade. Delco.

Price of Half Hose.

Editor Textile World Record:

Kindly advise us about what price the jobbers pay for men's half hose made on machines of 220 needles from 2/50s high grade mercerized yarn. We are aware of the fact that this hose will be higher than the 25-cent grade, due to the size and quality of yarn, which affords a better finish together with the fineness of the gauge, and presume that such hose would retail at 35 cents per pair. Benjamin (1147).

Regarding the 220-needle half hose, none of the selling agents seem to have this class of goods, nor do they know the size of the yarn used in manufacturing goods that they have to sell. The mills that I have communicated with say that 220 needle is unusual in men's hose. The popular count is 200 needle and yarn 2/40s in body, 2/32s in foot. Price for goods from domestic yarn, $1.30 to $1.75. The same count made from Egyptian yarn would be perhaps 15 to 25 cents higher. I think your correspondent must refer to foreign made goods. There is no probability that any of the importers here know the size of yarn used in the goods that they have to offer for sale. I called on six concerns that sell half hose, but none of them have any idea regarding the size of yarn used in their goods. Fillmore.

Knitting Department

THE KNIT GOODS SITUATION.

The situation in so far as it refers to knit underwear is not greatly different from what it was at our last writing. January was a quiet month among the manufacturers and agents up to about the twentieth, when some activity was developed by the influx of buyers who came East to attend the meeting and joint banquet of the manufacturers' and jobbers' associations.

Jobbers are experiencing considerable difficulty in getting up a line of ladies' twenty-five cent ribbed vests and pants. The number of manufacturers of this class of goods has steadily decreased until at present they can be counted on the fingers of one hand.

It is understood that the Royal Gem Mills have sold some six-pound goods for July delivery at $2 and some seven-pound at $2.-20, but that these quotations are now withdrawn.

The Lion Mfg. Co. have taken some orders for delivery during the first three months of the year at $2, but ask $2.15 for six-pound peeler goods to be delivered after July first, and ten cents a dozen additional for bleached goods.

The writer has been informed that the Jesse V. Palmer Co., of Greenwich, have disposed of their purchase of yarn and shut down the mill, their profit on the sale of the yarn being more than could be made by making goods to compete with the above quotations.

The Greenwich Knitting Co. have as yet shown no samples of ladies' goods, although they usually make 25-cent grades, but this year are endeavoring to run their mill on children's goods, on which they can see a better margin.

From all the information obtainable, it is evident that the buyers have placed orders liberally on men's fleeecd goods at from $3.-50 to $3.75 and at these prices, some very creditable values are being shown.

Men's heavy-weight ribbed goods have been in good demand and while the number of manufacturers making this class of merchandise has increased considerable during the past two years they all seem to be well supplied with orders. The principal volume of business is on goods weighing about 11 pounds per dozen at from $3.60 to $3.65.

Duplicate orders on spring lines have come forward quite freely during the past month. Reports from retailers indicate that there has been a call of considerable volume during all the winter months for light-weight goods, and it has been necessary in many instances to draw on orders that were placed for spring delivery. This increased demand has manifested itself in additional orders from the jobber to the manufacturer.

HOSIERY.

Good business has been booked by manufacturers on fleeced and woolen goods and it is difficult for jobbers to place duplicate orders on desirable spring merchandise for such deliveries as they want. Many manufacturers have their entire production sold until some time in June.

A new style of women's hose is one made with a full-fashioned leg and a seamless foot. These have been made for some time in Germany and have been featured here by some large retail stores, but have just been copied by domestic makers. They are in qualities to retail at 35 cents and upward, but no large orders have been placed on account of qualities not being as good as the regular full-fashioned kind. Makers state that it costs more to manufacture these goods with the seamless feet than the fashioned.

Many makers of seamless goods are now turning their attention to the making of silk goods and several styles are already on the market. The lowest price seen so far is $3.75, made of spun silk with lisle garter top and sole. A boot silk with lisle top is also shown at the same price.

In men's half hose, pure thread silk can now be had in a quality to retail at 50 cents, and infants' hose are being made of both spun and pure silk at various prices from $3.25 up.

The best makers of full-fashioned ladies' silk hose are still sold ahead for about four months, but the preparation for increased production now going on among different mills is expected to relieve the situation somewhat by next fall.

Chemnitz reports state that manufacturers there are supplied with enough orders to keep all machines running full time until well into March, especially on fine gauge goods. In consequence of this wages have advanced. Prices are high and firm, with a tendency to go still higher. It is true, of course, that Chemnitz lost about four months while the tariff bill was pending and that the rush now is occasioned to a great extent by that loss of time.

Lace hose are reported very much in demand, with all machinery busy and prices going up rather more than on other goods.

The colors reported bought are the same as for last season, with lavenders and grays as favorites.

FANCY KNIT GOODS.

This is a branch of the business that jobbers are paying more attention to each season and it is noted that retailers are giving more space to the display and sale of such articles, as sweaters, coats, shawls, Newport scarfs, mufflers and skirts.

Cleveland and Milwaukee have both developed into quite important centers in the manufacture of this class of goods, although there are a number of large plants located in New York, Brooklyn, Jersey City and Philadelphia.

The great sale of sweater coats has been the means of bringing into prominence the entire line, and we learn now that there are several lines practically sold up for 1910.

Some very creditable looking wool mixed coats are being offered as low as $7.50, and are being taken in white, cardinal and oxford. At $13 a dozen very good fancy stitch all-wool goods weighing about eleven pounds per dozen may be had and many lines of all-worsted coats are offered at $18 and upward. There is not as much demand for the plain stitch mannish looking garments for women as there was last season, but the tendency is toward the fancy-stitch-shaped coat.

Another article in great demand during the past season was knit mufflers. These were sold in the low grades mercerized yarns as low as $1.85 and in a better quality at $3.50 and $3.75. They were advertised extensively and as they were put up in individual fancy boxes great quantities of them were sold during the holiday season. We learn that some of the more widely advertised lines like the Phoenix and the Bradley were exported to England where a ready sale was found for them.

For the season of 1910 both the Bradley and the Phoenix will be made with a V neck. The Way Company are putting on the market a muffler made with a curved neck, which is claimed to be perfect fitting and on which some large orders have been placed. The Rich Company in Cleveland are showing a V-necked muffler that gets to the retailer for 25 cents, and the indications are that there will be little if any demand for a straight neck muffler for the season of 1910.

HOSIERY CONVENTION AND EXHIBITION.

The National Association of Hosiery and Underwear Manufacturers announces that the sixth annual convention will be held at Philadelphia on May 16 to 20. There will also be an exhibition in connection with the convention. The membership of the association has shown a gratifying increase since the last convention. Exhibitors are contracting for space, which is sold at a uniform rate, regardless of location, so that the earliest applicants have the choice of position in the exhibition.

A new trade has sprung up in Bradford during the last 30 years in the export of waste, noils, and tops. In 1882, which was about the beginning of this development, the export of the three combined was only 1,000,000 pounds, but in 1907 the exports had grown to 57,500,000 pounds. The export of yarns in 1854 amounted to 15,700,000 pounds, in 1882 to 40,500,000 pounds, and in 1907 to 83,000,000 pounds.

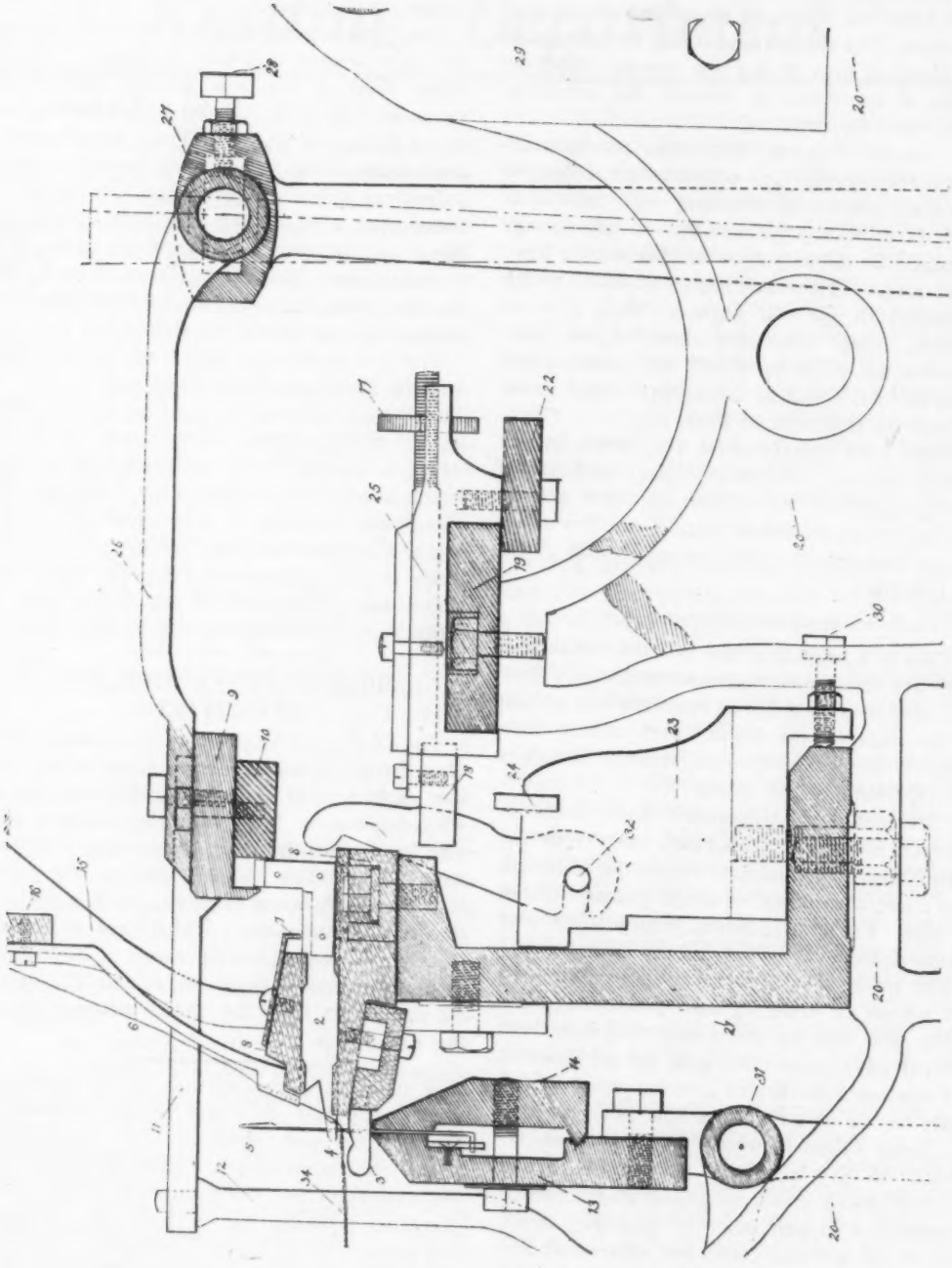


FIG. 20. SECTION OF FULL FASHIONED KNITTING MACHINE. FOR REFERENCES SEE FOLLOWING PAGE.

FULL FASHIONED KNITTING.

BY JOHN DAKIN.

(Continued from November.)

The method of the consecutive sinker impelling motion or, as commonly called, the drawing motion, having now been explained, we will go back to the catch-bar actions. We already know what the sinkers are, and that they, the jack sinkers, have a single motion and also a united motion. The single motion is to enable each sinker to come forward in its turn and from a single thread draw loops between the needles until a whole course is formed.

The united action of the sinkers is required in the first place to hold this row of loops tight against the needles, while the needles move downward to enable this recently formed row to pass under the open beards; secondly, all the sinkers must move back simultaneously to allow the needles to press, and again further back to clear entirely from this row of stitches, giving the needles entire control of the loops, and allowing them to be drawn through the previously formed fabric.

On all Cotton machines, these simultaneous and consecutive sinker actions are necessary, although some of the motions have been eliminated on certain machines. It is a question in the writer's mind whether any real advantage has been gained by departing from the fundamentals of the original motion. A large size end view of the catch-bar is shown at Fig. 20. The sinker-heads must be set in a straight line to enable a groove in this catch-bar to be lowered over all the sinker-tops. On an 18 section machine the catch-bar is about 30 feet in length, and it must fall by its own weight over the heads of all the combined sections.

The drawing motion which throws the sinkers forward when making the course of loops, works from alternate sides; coming from left to right one course, and after having knitted the course into the fabric, starting on the next course of loops from right to left. This is necessary as the knitting is done from a continuous thread.

The thread-carriers, one of which is seen in Fig. 20 at 6, are actuated by the drawing-motion arrangement, and move from right to left and vice-versa, always carrying the thread a little ahead of the sinkers which are drawing the loops.

These thread guides are carried on rods and are moved by means of a friction device connected to the drawing or longitudinal motion device, which allows the guide to be stopped at any desired point.

The carrier rods, by various arrangements of slides on the different machines, are made to operate parallel to the line of the needles and sinker-heads. On account of the very accurate adjustment required by the carriers, some builders use as many as 20 of these slides on an 18 section machine to insure the maintenance of this parallel and give support to the rods.

REFERENCES FOR FIG. 20.

1. Striking jack
2. Jack sinker
3. Knocking over bit
4. Dividing sinker
5. Knitting needle
6. Carrier rod
7. Falling bar
8. Sinker head
9. Catch bar
10. Adjustable bar
11. Catch bar raiser bracket
12. Catch bar raiser arm
13. Needle-bar
14. Needle clamp plate
15. Carrier-rod slide-bracket
16. Carrier-rod
17. Slur cock (star) adjuster
18. Slur-cock
19. Slur-bar
20. Standard and bed
21. Head rail
22. Bar for converting slur cocks to drawing apparatus.
23. Jack head
24. Jack back-stop bar
25. Slur cock slide
26. Catch bar horizontal bracket
27. Catch bar arm
28. Adjusting screw for catch bar
29. Narrowing machine bracket
30. Jack head adjusting screw
31. Fulcrum pivot of needle bar
32. Jack centre-rod
33. Thread (cotton, silk or lisle)
34. Fabric

A slide bracket with accommodation for 6 carrier rods is shown in Fig. 31. A large number of machines made by a German concern have been equipped with aluminum carrier rods on account of their extreme lightness, the tendency being with heavy rods to rebound on striking the stop. Aluminum rods were welcomed by knitters because they enabled much lighter friction boxes to be used. Steel carrier rods require a much stronger friction than do aluminum rods, not because of the increased power required to move them in the slides, but to

prevent the rebound which is far greater with a heavy rod. When a rebound occurs, the sinkers, which are being thrust forward in rapid succession an inch or so from the point of the carrier as it moves along with the thread or yarn, catch up and pass the carrier before the rod has time to settle on the stop. The result is several stitches pressed off the needles. If the carrier is not firmly held in its exact position on the stop, a good selvage is impossible. The English or original Cotton machines have brass tube carrier rods on to which the thread carriers are fastened. They are very light, and no better arrangement for convenience or efficiency has yet been devised.

The width of the knitting is regulated by the stopping device of the yarn carriers, for the work will be as wide as the carrier moves the yarn. The needles and sinkers go through the knitting motions at each revolution of the cam shaft, irrespective of whether the yarn is being knit or not. If yarn is there, it is turned into fabric, and if no yarn is there the operations are still continued by the sinkers and needles. When the thread carrier stops, the edge of the knitted fabric is formed. Irrespective of the width of fabric being knit, the entire section of sinkers and needles continue to operate. The friction devices for giving motion to the thread guides vary greatly, there being scarcely two alike in all the various makes. Each builder claims superiority for his own design.

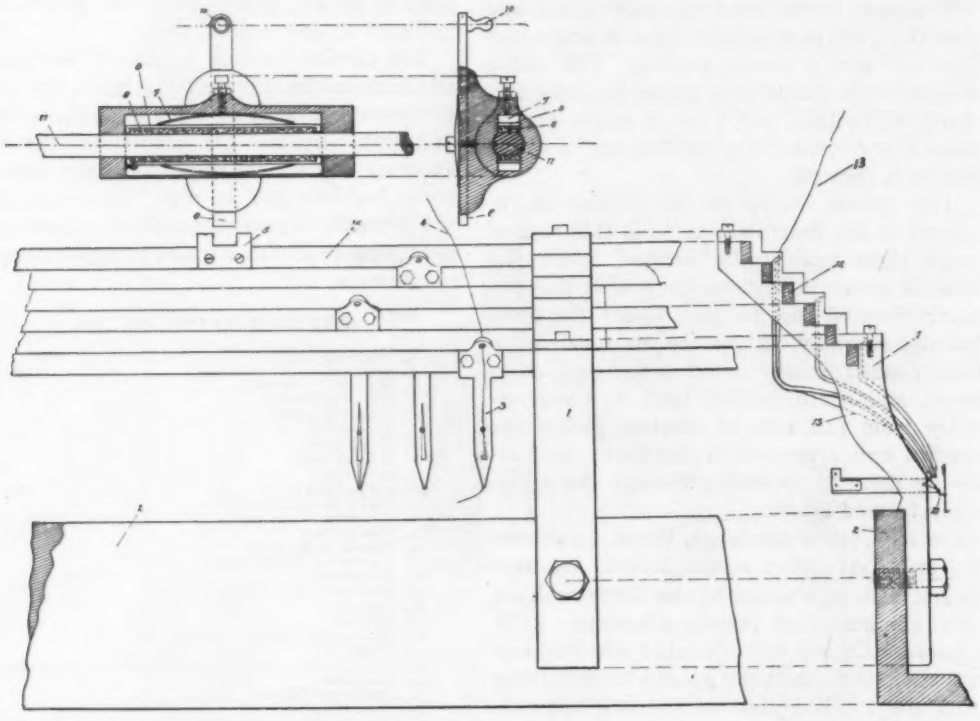


FIG. 31.

1. Carrier bracket.
3. Head Rail.
3. Thread Carrier.
4. Yarn.
5. Bracket for friction box connection.
6. Connecting slide.
7. Spring.
8. Friction (leather.)
9. Iron plate.
10. Handle.
11. Friction rod (steel.)
12. Carrier rod.
13. Threads.

On the machine built by The Textile Mach. Works, Reading, Pa., the friction arrangement is one of the simplest and easiest of operation, having a device whereby the friction can be immediately released and just as quickly applied by a lever action at-

receive the same throw as the slur-cocks, which likewise never vary in the distance they travel.

Fig. 31 shows the friction-box disconnected from the carrier-rod. It moves, in this position, the entire length of the stroke of the rod, 77, but when the slide, 6, is connected with the bracket on the carrier-rod it is prevented from doing this. The carrier-rod takes the same line of motion as the friction rod, the two being parallel. When the carrier-rod hits the selvage stop, the friction box remains locked in the bracket, 5, Fig. 31, while the friction-rod, 77, continues on its journey to the end of the stroke, the friction pressing the rod very firmly against the stop until the remainder of the stroke is finished.

It is at the point where the rod, 77, begins to slip through the frictions that the necessity for additional friction over that required to take the carrier across becomes manifest, that being the point of rebound. The velocity of the friction-rod is probably about 150 feet per minute, a greater or lesser velocity requiring more or less friction. I mention this because it not only concerns the knitting, but its improper adjustment can be the source of endless trouble to the seamers and menders. In the seaming of full fashioned hosiery, a selvage which has been broken by the rebound of the carrier rods is one of the most difficult to handle, because in no instance is less than two stitches thrown off. A peculiar trait of this rebounding carrier selvage is that the fabric forms correctly on the needles immediately after, and successive rebounds cause the selvage to resemble the teeth on a saw.

To make the regular plain full-fashioned stocking on a leg machine four carrier-rods are necessary. That means that each section requires four yarn carriers. One is required for the regular body of the stocking, an extra one for the heel, and two others for splicing.

There are numerous things yet to explain about the Cotton machine and a knowledge of some of them will be more easily gained by going slowly over the motions already explained. As the knitting is really only part of the action of the Cotton machine, it is better to understand it thoroughly before taking up the fashioning process. The cam shaft receives its motion from a countershaft which usually derives its motion from a belt. This counter is electrically driven in the machine built by the Textile Machine Works. The cam shaft is geared into the driving shaft, and reduced three times, consequently, the driving shaft revolves three times for each revolution of the cam shaft. Fig. 8 shows this drawing and gear arrangement very plainly.

On the driving shaft are hand wheels by which the machine can be turned slowly to any desired point. This feature is of course necessary on any kind of knitting machine. There is generally one hand wheel to each two sections on all cotton machines. A fly wheel is used to balance the motion when running, and is placed on the counter or driving shaft, which has the greatest speed. To gain some idea of the application of these parts which have been explained, let us consider the machine as going through a simple motion of knitting a course of yarn. Suppose that the machine is standing, it having finished knitting its previous course. The fabric is on the needles, which are standing in their highest position ready for the next course of stitches to be formed. Fig. 20 shows the relative position of needles and sinkers. If the counter shaft is turned very slowly by a hand wheel, the cams will begin to revolve, but at this point no motion can be observed in any of the levers or arms, the cams being circular for every motion during the drawing of the course, when not splicing The only irregular cam for this first half revolution of the cam shaft is the drawing cam, which is operated through the beveled gears at right angles to the cam shaft. After a few degrees of motion, this drawing cam starts the arm which actuates the slur box, Fig. 23.

If we watch the knitting head, the first movement noticed will be with the thread carrier. It begins to travel along the head, behind the needles and just above the sinkers. The sinkers at this point are back and

stand ready to be forced forward. After the yarn carriers have moved an inch and one-half or so, we find the jack sinkers beginning to come out, the slur cocks having moved a sufficient distance to enable their tapered edge to thrust the jacks forward.

The thread is now drawn or rather pushed by the sinkers through the needles and formed into loops around the sinkers and needles. As one sinker finishes drawing the thread, the next one starts, and so on, continuing this process to the end of the course, the carrier keeping in the lead with the yarn until the yarn carrier hits the stop. After the carrier has stopped, the sinkers still continue to come forward, drawing each its loop, and gradually shortening the distance of the lead of the carrier until, having caught up to it and after drawing loops up to the point of carrier, they continue past and finish the full course, although no loops are made after passing the carrier. After forcing all the sinkers forward, the slur cocks continue to move a sufficient distance to allow the jacks to fall back in preparation for the next course and to allow the catch bar to draw the sinkers back in process of knitting the loops into fabric.

(To be continued.)

The cotton-mill industry in Canada began at Dundas, Ontario, in 1856. Up to 1878 only the coarsest goods were made. From this year the growth began. About 1886 consolidations took place which gave still greater impetus to the industry. Today the mills make ducks and drills, cotton quilts, prints, dyed goods, linings, and colored prints, in addition to coarser grades. Mills of this kind are great consumers. Besides building material of all kinds, machinery, iron, coal, and raw cotton, they use an immense amount of supplies, such as oil, paper, bleaching powder, belting, twine, electric supplies and tools. Over $1,500,000 is spent each year on supplies, excluding coal, which costs approximately $750,000. For raw cotton from the United States over $6,000,000 was paid last year. The total income of the industry was about $15,000,000.

THE FIRSCHING NECK MARKER.

The neck marker built by Joseph A. Firsching, 22-28 John St., Utica, N. Y., does the work of the old-style pencil marker which every knit goods manufacturer knows was objectionable in many ways. The Firsching marker is designed to overcome the difficulties which were inherent in the old style of marking. The production of this machine is measured only by the capacity of the operator to handle the goods. Although marking at a rate as high as 100

THE FIRSCHING NECK MARKER.

per minute the motions are so adjusted that the heated die is held on the goods during three-quarters of a revolution of the shaft, giving time for the marks to be ironed thoroughly into the fabric. This overcomes one of the objections to the work by machines in which the attempt is made to iron the mark instantaneously. The extra forms, of which there are an unlimited number, may be heated in an oven at the left of the machine and are ready for use at all times. The forms can be changed in five seconds. They make a clear, distinct and permanent mark.

One very important feature of the machine is the adjustable pointers or indicators on the table. By the old style with two di-

vergent numbered scales a large number of garments are centered and marked inaccurately. With the Firsching machine the pointers are adjusted instantaneously and accurately by a hand lever in front of a single scale, as shown in the illustration. These marking machines have been installed in many of the most important knitting mills throughout the Mohawk Valley and the builder will be pleased to give references and further information to any one interested.

A WINDING MACHINE.

The winding machine built by Jacob K. Altemus, 2816 North Fourth St., Philadelphia, Pa., presents many valuable features which appeal strongly to knitters. One of these is the paraffin attachment for sweater yarns which, it is claimed, gives results far in advance of any hitherto obtainable. The application of parrafin by this attachment enables very low stock to be knit as successfully as high grade yarns. Tender yarns can thus be wound hard with very little tension. Owing to this and other improvements the builder is confident that the machine is unequaled by any other for quantity and quality of work. In addition to the winder Mr. Altemus builds a line of spoolers and warpers for rib machines. Also a general line of winders and spoolers adapted for all kinds of yarn, warpers to make warps of any size or width, beamers to handle the warps for any woven fabric, and tape machines for manipulating the warps to convert them into marketable condition.

Mr. Altemus also builds many other textile machines concerning which he will be pleased to give buyers detailed information on application. His long experience as a textile machine builder enables him to cope successfully with the various problems encountered in the mill.

For the nine months ending September, 1909, the United States imported 250,939,541 pounds of wool, as compared with 97,481,352 pounds during the corresponding period of 1908.

KNITTING MILL NEWS.

New Mills.

*Georgia, Douglasville. The new knitting industry will begin manufacturing about February 1 under the style of the Douglasville Knitting & Hosiery Mill. J. T. Duncan is at the head of the company.

Massachusetts, Methuen. The Jersey Knitting Co. have equipped a plant at 115 Pelham St. and are manufacturing stockinette, jersey cloth, cottonette, etc., for the rubber and underwear trade, on 8 spring needle knitting machines, operating the plant by electric power, and selling the product direct. Later a corporation will be formed with capital stock of $10,000 with A. N. Gilson, treasurer and manager. Mr. E. L. Barrows, Allston, Mass., is interested with Mr. Gibson. Mr. Gilson was formerly connected with the Jersey Cloth Co. of Methuen.

*Massachusetts. Northampton. Plans have been drawn for the new mill for the Northampton Silk Co., organized by the McCallum Hosiery Co. The main building is to be 160 feet long and 70 feet wide, 2 stories high, with cement basement. Machinery contracts are now being placed. As announced previously, the location is to be in Florence.

Massachusetts, Stoughton. A new knitting industry is being started here by Gilbert Harris of Stoughton and John J. Campbell of Hartford, Conn. They have incorporated under the laws of Connecticut with capital stock of $20,000 and organized with Gilbert Harris, president, superintendent and buyer and John J. Campbell, treasurer and selling agent. The production will begin as soon as possible, the lines to be made first comprising fine seamless hosiery and men and women's mercerized goods. About 12 knitting machines will be operated.

New Jersey, Dover. Hugo Huettig, formerly manager and secretary of Paul Guenther, Inc., expects to start a knitting plant on full fashioned hosiery in the near future. He is now looking for a suitable location. Mr. Huettig was one of the founders of the German American Hosiery Co. of Philadelphia.

*New York, Albany. Manufacturing will be started by the Albany Knitting Co. about February 1 at 34 Greene St., where 60 knitting machines and ten sewing machines have been installed for making men's, women's and children's sweaters, gloves and knit novelties. This company has taken over the machinery of the Columbia Knitting Co. of Kinderhook, N. Y., which has been idle for some time. The new company has capital stock of $20,000. I. Milstein is president and buyer; Barney Silverman is treasurer, and Frank Smith, superintendent. If they are as successful as they anticipate new machinery will be added within a few months.

New York, New York City. Gutman Bros., 452 Broadway, are considering plans for establishing a silk hosiery plant. The location has not been

decided upon, but will either be Union Hill, New Jersey, or New York City.

*Oklahoma, Frederick. J. W. Blackwelder of Hickory, N. C., will organize the Frederick Knitting Mills. A plant will be built and equipped which will have an annual output of 1,800,000 pairs of hosiery. Mr. Blackwelder will be president of the company.

Pennsylvania, Bethlehem. The new Jewell Knitting Co. has leased three floors in the building at Conestoga St. and Prospect Ave., and this space will be equipped with machinery for the manufacture of women's and children's underwear. They are now operating 5 knitters and 21 sewing machines, using 11s to 26s cotton yarns on cones. The capital stock is $10,000. J. M. Roberts is president; R. S. Cunningham, secretary and treasurer, and Robert D. Pearson, general manager and buyer.

Pennsylvania, Dorrancetown. Berth & Weston have secured quarters on Dorrance St. and will install machinery for making a line of cotton seamless half hose.

Pennsylvania, Easton. Walter H. Clarke, Ebon R. Wright and Parke H. Davis, of this city, will apply for a charter for the Clarke Knitting Company, the object of the company being to manufacture knit fabrics.

Pennsylvania, Martins Creek. The Clarke Knitting Co., successors to the Pearson Knitting Mills of South Bethlehem, are building a mill of concrete blocks, 3 stories high, 31 by 72 ft., and expect to begin manufacturing here about April 15. They manufacture women's and children's underwear, operating 12 knitting and 32 sewing machines by steam power. The Clarke Knitting Co. has capital stock of $10,000. W. H. Clarke is president, E. Wright is treasurer, Clarence J. Clarke, agent, and Herbert E. Clarke, superintendent and buyer.

Pennsylvania, Nanticoke. Recently the Nanticoke Hosiery Co. started manufacturing on Prospect St. with 60 knitting machines, operating on white foot half hose and women's and split-foot goods. The plant is equipped with dye house in which they dye skein yarns and in the piece. Their capital stock is $25,000.

Pennsylvania, Philadelphia. Burns A. Roby of 3243 North 6th St., and others, are about to incorporate a company for the manufacture of hosiery and have leased a part of the manufacturing building at Hunting Park Ave. and Marshall Sts., in which they will install 12 full-fashion knitters, 5 loopers and 7 sewing machines on which they will manufacture women's 39-gauge full-fashioned hosiery. The machinery has been ordered from abroad and is expected here probably by April or May 1st. Mr. Roby, who will manage the plant, was formerly employed by the late Lee Hosiery Mills of this city.

Pennsylvania, Philadelphia. H. A. Metz, formerly connected with M. A. Metz & Bro., has started a plant at 125 North Third St. on fancy knit and crocheted goods, operating by hand power and selling the product direct. Wool, worsted, mercerized and cotton yarn is bought.

Pennsylvania, Phoenixville. C. A. Bachman is equipping a plant at 138 Bridge St., in which he will manufacture hosiery. The machinery is now being delivered and will be in operation in a few days.

Pennsylvania, Shamokin. A few days ago the Shamokin Knitting Mills were incorporated with capital stock of $10,000 by M. Elmer Malick, Irvin S. Malick and others. The new company is building a knitting mill to be equipped with 20 knitting machines for making hosiery, operating by steam power. They expect to begin manufacturing about February 1 with 25 hands. Irvin S. Malick is president and superintendent and M. E. Malick is treasurer and buyer.

Pennsylvania, South Bethlehem. A knitting plant has been started at Bishopthorp and Cherokee Sts. under the name of the Monarch Knitting Co. with capital stock of $5,000. P. E. Kressley is president, treasurer and buyer. They manufacture ladies' and misses' ribbed vests, operating 5 knitters and 12 sewing machines, using 22s carded cotton yarns on cones.

*Pennsylvania, Tatamy. A new knitting plant has been started under the style of the Gold-Wiley Hosiery Co., and will be incorporated in about three months. Miller R. Wiley will be president and buyer, and Edgar L. Gold of Nazareth, superintendent and probably treasurer. The new concern makes seamless and full fashioned half hose, using 16s, 18s and 50s yarn, operating 14 knitting machines and 2 sewing machines by electric power. Their plant is located in an old building which has been used for other lines of manufacturing. They will finish and want a press and boards.

*Tennessee, Cleveland. The plant to be erected by the new Weiss Hosiery Mill will consist of a brick building, 50 by 150 ft., with separate boiler and engine rooms. As noted previously the initial equipment will be 50 knitting machines for manufacturing men's and women's hosiery from 20s to 24s combed peeler and mercerized yarns. The plant will be operated by steam power and be equipped with complete dye house. C. H. Weiss is president and treasurer, and P. B. Mayfield is treasurer. The capital stock is $25,000.

*Virginia, Norfolk. The Knitting Mills Corporation, recently reported incorporated, will begin manufacturing in the spring with 29 knitting machines and 30 sewing machines, operating on women's ribbed underwear and giving employment to 100 hands. They have taken over what was the Northside Knitting Mill. The machinery will be operated by electric power and the product sold through Clift & Goodrich, New York. The capital stock is $25,000. Garland Peed is president and H. R. Furr, treasurer.

*Virginia, Suffolk. The Maxwell Hosiery Mills, Inc., will begin manufacturing about Jan. 17 with 25 knitting machines and 1 sewing machine, operating on women's and children's seamless hosiery. The machinery will be driven by electric power. M. Maxwell is president; H. E. Maxwell, treasurer, and C. H. Pate, superintendent and buyer. Their post-office address is Box 44, Suffolk, Va.

Mills Starting Up.

Rhode Island, Pawtucket. The plant formerly operated by the Narragansett Textile Co. has come into possession of Wm. Whitman, Boston, through bankruptcy proceedings, and is being operated by Mr. Whitman under the name of the Sakonnet Knitting Co. The present arrangements are not permanent, however, as we are advised the property will be disposed of as soon as favorable terms can be made. The same lines of goods are manufactured now that were made by the Narragansett Textile Co.

Mills Shutting Down.

Pennsylvania, Allentown. The Sterling Knitting Co., which started manufacturing in the fall of 1909, has discontinued. The machinery has been taken over by the new Jewell Knitting Co. of Bethlehem.

Facts and Gossip.

British Columbia, Vancouver. The Vancouver Knitting Co. has been incorporated with capital stock of $25,000 for the purpose of manufacturing women's and children's knit goods and sweaters of all kinds. D. F. Quigley is president; Chas. B. Quigley, vice-president; F. A. Quigley, sales manager; J. W. Curran, treasurer and manager. The new corporation takes over the Vancouver Knitting Co., formerly 730 Nelson St., Chas. B. Quigley and Marguerite Quigley, proprietors. The present plant is located at 135 Hastings St., W. New machinery is in transit and when set up will give total equipment of 7 hand knitting machines and 2 power knitting machines. Mr. Curran is buyer. While no immediate enlargement is contemplated, they are interested in information on all machinery and supplies applying to the knit goods trade.

Massachusetts, Brockton. The Harding Knitting Co. has been bought by the Stall & Dean Mfg. Co. The new firm is composed of C. H. Dean and Wm. T. Stall, president and treasurer respectively of the Harding Knitting Co. The old company consisted of Messrs. Stall and Dean with Hawley Harding. The business will be continued with W. Franklin Dean as superintendent.

Massachusetts, Millbury. Attachments blocked the sale of the Worcester Knitting Mills. Announcement will be made later of the date of sale of the property.

Massachusetts, Needham Heights. Stockholders of the John F. Brooks Co. have voted to issue $30,000 of the authorized capital for cash. The money will be used for working capital. Recently this company took over the plant of the Boston Hosiery Co., Bedford St., Boston, and removed it to Beach St., Boston, where it is being operated as a branch of the main plant at Needham Heights.

Michigan, Detroit. The Chicago Hosiery Co. has been incorporated with capital stock of $75,000. It is understood the new corporation takes over the business of the same name located at Michigan Ave. and 12th St.

New York, Brooklyn. The Federal Knitting Mills have been incorporated with capital stock of $4,000 by Edwin E. Krauscher, 146 Hart St., Isaac Bretman, 134 Boerum St., and others.

New York, Brooklyn. The Diamond Knitting Mills have been incorporated with capital stock of $10,000 to manufacture hosiery, underwear, etc. Ray Sheindelman, 62 Vernon Ave., Phillip White, 36 Graham Ave., and others are the incorporators.

New York, Brooklyn. The London Knitting Mills have been incorporated with capital stock of $5,000 to manufacture knit goods. Abraham Herzog, Dinah Herzog, 167 Vernon Ave., Pauline Simon, 163 Pulaski St., Brooklyn, are the incorporators.

New York, Brooklyn. The South American Knitting Mills have been incorporated with capital stock of $2,000 to manufacture sweater coats, etc. Harry Berger, 230 Ellery St., Max Reichelsohn, 28 Summer Ave., and others, are the incorporators.

Personals.

E. W. Jasper, manager of the Continental Needle Company, who is well known in the trade, fell on the walk while running for the train at Rosell, N. J., and fractured his knee cap. He will be laid up for some time.

Geo. H. Jepson has recently been appointed general manager of the Tippecanoe Underwear Company, Tippecanoe City, Ohio. Chas. K. Coit, secretary and treasurer of this company, has recently severed his connection with this firm. Mr. Crane was elected secretary and treasurer.

Edward L. Humphrey, superintendent of the knitting, cutting and napping department at the Lion Knitting Company, St. Johnsville, N. Y., has severed his connection with that company after 17 years of service.

William Clogher has been appointed superintendent of the Dr. Denton Sleeping Garment Mills, Centreville, Mich. He comes from St. Mary's, O.

J. H. Shields has accepted a position as overseer of knitting at the Piedmont Mills company, High Point, N. C. He was formerly employed at the High Point Hosiery Mills.

E. H. Scott has accepted the position as overseer of knitting at the Zebulon Hosiery Mills, Zebulon, N. C. He was formerly employed at the Durham Hosiery Mills, Goldsboro, N. C.

Wm. Algie, Jr., has accepted the position as sewing machine fixer at the Elmira Knitting Company, Elmira, N. Y. He comes from Little Falls.

Chas. C. Groat, general manager of the Groat Knitting Mills, Scranton, Pa., has severed his connection with that company. He is succeeded by W. H. Logan.

P. T. McLendon, superintendent of the Minneapolis Knitting Works, Minneapolis, Minn., has severed his connection with that company.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Winding Machine. Oswald Lever Co., Lehigh Ave. and Front St., Philadelphia, Pa. A yarn winder for knitting mills, with paraffin attachment. A description of this machine appears in another part of this issue.

Neck Marker. Joseph A. Firsching, 30 John St., Utica, N. Y. A neck marker for underwear. A description will be found in this issue.

Bobbin Changer. The Elsaessischen Maschinenbaugesellschaft, Muelhausen, Germany. A device for changing the bobbins in an automatic loom.

Drying and Carbonizing Machine. Friedrich Haas, Lennep, Germany. An improved continuous drying and carbonizing machine for cloth. It embodies a number of new features as compared with the previous machines turned out by this builder.

Oiler for Spinning Frames. Wilhelm A. Tries, M. Gladbach, Germany. An automatic oiler for the pressure levers on spinning rollers.

Spinning Roll. Albert Koechlin, Mulhausen, Germany. An attachment to a spinning frame by which the top roll is raised in piecing broken ends.

Yarn Reel. Th. Grossklaus, Muelhausen, Thueringen, Germany. A yarn reel with expansion arms which can be easily adjusted within wide limits to suit any size of skein required.

Cloth Dissector. E. Smith, Garnett St., Bradford, England. A device for holding a sample and measuring a given distance, say 1/4 inch or one inch, in which the threads are to be counted for the purpose of dissecting the fabric.

Duster and Mixer. Morton, Son & Co., Ravensthorpe, England. A duster or shake willey for cleaning wool, cotton, hair, flocks, waste, rags and other textile materials. It is provided with an automatic feed. The stock is carried away from the delivery end by an air draft through suction pipes.

Bearing for Drying Machines. The Spring Packing Co., Rawtenstall, England. An improved steam tight bearing in which the packing is held tight by an expanding spring.

Locking Device for Cotton Cards. Dobson & Barlow, Bolton, England. Device for locking covers of card cylinders while the machine is running.

Motor for Variable Speed. Maschinenfabrik Oerlikon, Zurich, Switzerland. An electric motor for driving cloth printing machines and which can be adjusted to run at the speed desired.

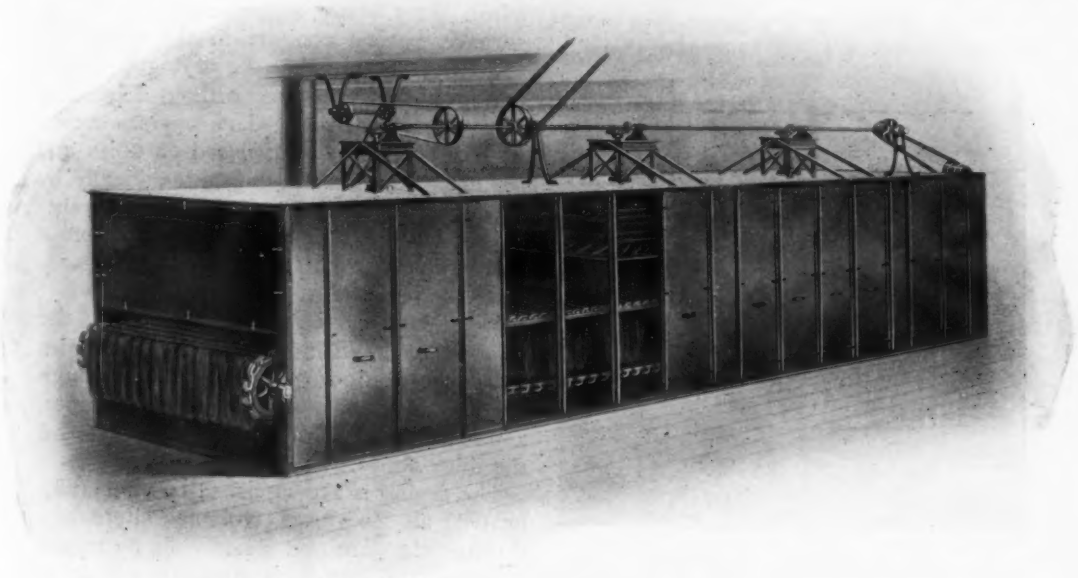
Embroidery Attachment. Societe Louis Veyron & Cie., Paris, France. An attachment for producing embroidered effects on goods during the process of weaving.

Measuring Machine. Moritz Ebeling, Barmen, Germany. A measuring device for spooling and doubling machines, the length being indicated in the usual way by a hand on a dial.

Winding Machine. Herman Schroers Maschinenfabrik, Krefeld, Germany. A machine for winding yarn on bobbins. The thread guide is stationary the bobbin built by a vibration of the spindle.

THE PROCTOR FIREPOOF AUTOMATIC YARN DRYERS.

The introduction of the Proctor raw stock dryer, built entirely of metal, caused a demand for similar construction in a yarn dryer. This demand has been met by the Proctor fireproof automatic yarn dryer after a careful study of the requirements.



THE PROCTOR FIREPROOF YARN DRYER.

The builders refrained from advertising this dryer for sale, notwithstanding the favorable reception from those having it in use, until it had been in operation a sufficient length of time to bring out any possible weak points. The first metal dryers built have now been in operation many months and no weak points have appeared. So far as those using them have stated, the dryer has reached a stage of perfection scarcely hoped for by the builders.

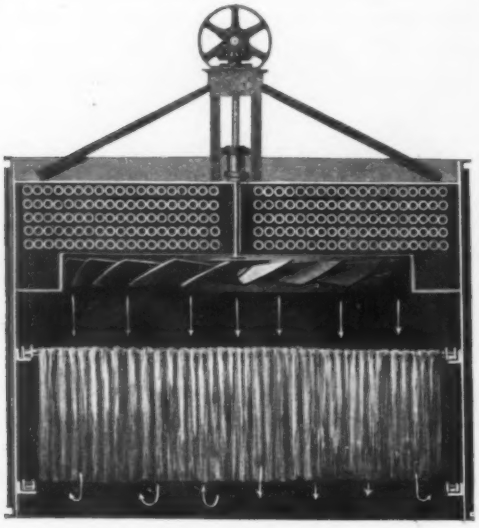
A practical mill man will readily understand the great advance made by the elimination of wood in the construction of a dryer, and by the elimination of bearings inside the dryer.

The illustrations give a very fair idea of the scheme adopted to secure the advantages of fan bearings entirely outside the drying enclosure and out of the heat in an accessible location, at the same time eliminating the dust pockets always present heretofore in dryers having bearings out of the heat. The method in use in the past for locating the fan bearings outside the heat was to build a pocket or recess in the dryer, placing the bearings in this pocket. While this was generally regarded as an improvement over those having bearings actually in the heat, yet owing to the likelihood of an accumulation of dirt and grit in these recesses and the lack of circulation of air, the advantage over the old method was questioned.

The method adopted in the new dryer is to build a steel truss above each fan, one bearing being mounted on the top of the truss and the other at the bottom, the fan being hung to a shaft extending down into the dryer. Both bearings are thus located above the roof of the dryer where the cool air is free to circulate about them, where

they are accessible at all times for oiling purposes whether the dryer is in operation or not. This arrangement also precludes the possibility of oil dripping on the yarn.

The framework of this dryer is built of structural iron and steel put together in accordance with the most approved engineering practice. The rivets are all driven hot to secure tight joints and only those parts are bolted which it may be desirable to take apart to move the dryer. These bolts have



SECTIONAL VIEW OF INTERIOR OF PROCTOR YARN DRYER.

lock nuts on them to insure their remaining tight in spite of any vibration in the dryer. The panels forming the enclosure are built upon structural steel frames having two sheets of metal with an asbestos air cell between, clamped to the steel frame of the dryer with eccentric hand bolts. The panels are removable so that the interior of the dryer may be readily reached for cleaning purposes. Exhaustive tests have clearly demonstrated the superiority of this panel over wood and other combination panels from the standpoint of retaining the hot air currents and as a non-conductor. This construction insures great comfort to the operatives and a maximum capacity from the dryer with a minimum expenditure of fuel.

The Proctor fireproof automatic yarn dryer is built in two designs, one with the air passages and heater coils arranged on the two sides of the machine, and the other with heater coils arranged above the fans in the chamber through which the yarn travels. Where height of ceiling is limited or other factory conditions necessitate it, the former style is furnished. Otherwise the latter machine is the one used.

The advantages claimed are a saving in labor, floor space, steam consumption, insurance, perfect comfort to the operatives and the assurance that the drying is always uniformly and well done without depending upon the operatives. The operation consists of the yarn being placed on poles and fed in at one end, passing automatically by means of special roller chains through successive chambers or sections graded from a high temperature at the wet end to a moderate temperature at the point of exit.

When constructed with a "drop leg," the yarn is poled and fed into the machine from the dyehouse floor, passing up and through the horizontal portion of the dryer proper, and is taken off at the end of the dryer on the floor above.

The drying is accomplished by circulating heated air in large volume alternately through the yarn and steam coils by means of large steel fans. A moderate supply of fresh air is admitted at the delivery end of the dryer and traverses the successive chambers in the opposite direction to the yarn. The saturated air is drawn from the dryer by a small fan located near the feed end.

The fans are driven by a carefully designed bevel gear drive, the gears being held in place by a right angle bearing made in one piece to insure perfect meshing of the gears at all times. The machine is arranged so that the passage of the yarn through the dryer may be stopped without stopping the fans and other machinery. Another advantage of this machine is that it may be increased in length at any time and thus proportionately increased in capacity, or it may be taken apart and moved to an-

other location at any time without injuring it in the slightest degree.

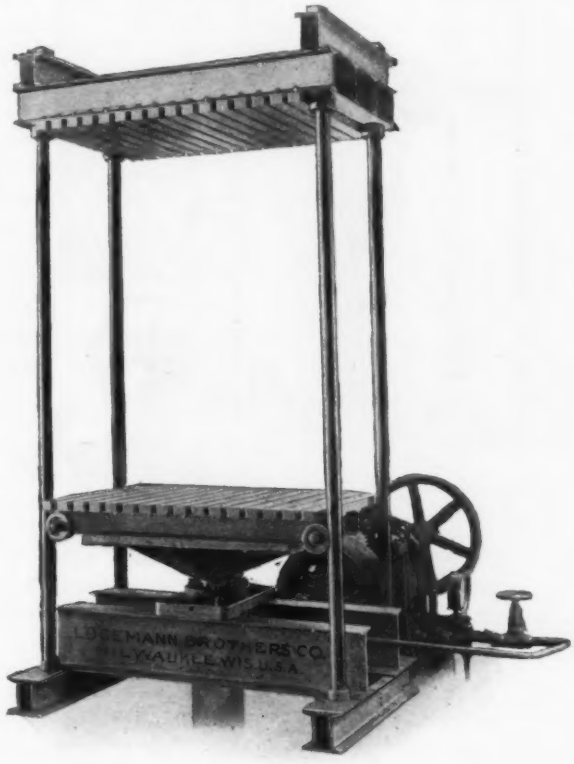
The builders of this machine, The Philadelphia Textile Machinery Company, Hancock and Somerset Streets, Philadelphia, Pa., solicit a thorough investigation and invite those interested to see it in operation in some of the many mills where it is in use.

AN IMPROVED BALING PRESS.

With the constant increase in cost of shipping cases and the time and space required to handle them, the value of a baling press has become more apparent to the manufacturer and shipper in textile industries. Many such presses have been installed without considering the cost of operation, but today nearly every intending purchaser realizes that the machine must be so built as to reduce the cost of the operating and maintenance expense to the minimum and to perform the work rapidly.

The use of baling presses results in a reduction of freight charges, as it eliminates the "short" account, so disagreeable to shipper, carrier and consignee. Nothing can be removed from the finished bale without rebaling in the press. This method dispenses with the troublesome duties and expense of locating the origin of shortages.

The illustrations show a hydraulic baling press for baling woolens, blankets, sheeting, flannels, overalls, wadding and other goods which can be safely baled for shipment. Being constructed of steel throughout, it is very powerful, but its method of operation merits the consideration of those desiring the greatest compression with comparatively little power. A valuable feature is the device added to the triplex pump, which operates

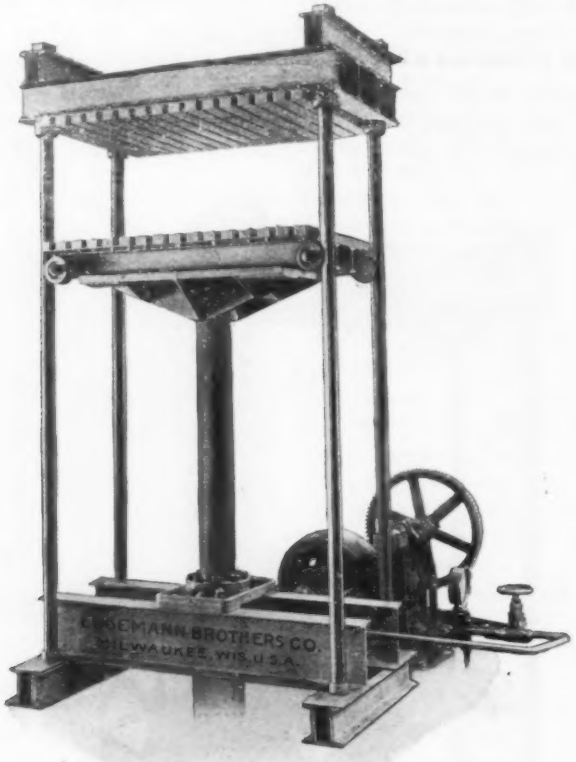


AN IMPROVED BALING PRESS.

the hydraulic press, in which there is a certain amount of lost motion to be taken up or the operation started at low pressure and high speed, and the work completed at high pressure and decreasing speed. Heretofore only the low pressure cylinders were fitted with the automatic release, and the high pressure controlled by a safety or relief valve, leaving the full pressure on the pump. With the improved device, when the maximum pressure is reached, which for illustration, has been set at 2,000 pounds, the press is held to that pressure, not more nor less, the automatic relief valve enabling the pump to continue in operation, but without carrying any load.

This is especially desirable in the baling of fluffy material, which is very loose at the beginning and with which possibly 80 per cent. of the compression can be obtained from the low pressure cylinder at quick speed. As the bale becomes tighter the high pressure plungers will finish the work automaticaliy.

While Logemann Brothers Co., 280 Oregon St., Milwaukee, Wis., the manufacturers of these presses, have given much attention to the hydraulic system, in fact so much so that their pumps are used for many other purposes, still the baling press industry has been specialized, so that they build a complete line of belt driven, electric and hand power balers, numbering thirty different styles and sizes.



ANOTHER VIEW OF THE IMPROVED BALING PRESS.

The exports of cotton cloth from the United States to China for the year ending June 30, 1909, were 139,987,013 yards, against 49,876,671 yards for the previous fiscal year.

BELTING FOR BLEACHERIES.

SOME RECENT TESTS IN THE FELS BLEACHERY.

The average bleach house in this country has much trouble with its belting, due to the fact that a bleachery must always be in a damp or wet condition and that acids and acid fumes are present, owing to the use of sulphuric acid and chloride of lime in the bleaching process. Washing, wringing and starching machines to do good work require belts that are able to withstand the action of water, acids and starches.

The bleacheries and dye houses in England and on the European Continent are practically all using balata belting at the present time. This is comparatively new in the power transmission field and the results of some experiments which have recently been made with balata belting in the bleachery of Frank P. Fells & Co., at New Durham, N. J., will be interesting as showing its adaptability for withstanding the action of acids, alkali and water. The facts are furnished by the New York Leather Belting Co., 51 Beekman St., New York, which equipped the plant throughout with "Victor-Balata" belting about eighteen months ago.

Victor-Balata

Operating Starching Machine at upper illustration.

Operating Squeezer at center illustration.

On Wringer and Washer in lower illustration.

The installation of balata belting included belting the following machines: Squeezing machines, wringers, washers, starching machines, counter shafts and blowers.

In connection with the belting on the squeezing machine the result of the experiment with Victor-Balata belting proved successful. It is well known that in the process of bleaching fabric passes through an acid treatment. It is placed in vats which contain chloride of lime and sulphuric acid. The fabric comes directly from these vats to the squeezing machine where it is run between vulcanized rubber drums. As the acids are squeezed out of the embroidery fumes are given out which make it almost impossible for one to live in the room. The acid solutions splash more or less upon the belts which operate these machines. The acid fumes and solutions which have come in contact with the belting on the splashing machines have not rotted or disintegrated the balata belts during this eighteen months' period. An ordinary leather belt under similar conditions usually does not last more than a few months.

In connection with the washer, as the fabric passes around the lower drum it is immersed in a tank of water. This process removes the acids from the fabric. Water is constantly splashing from the tank directly upon the belt which operates the machine. Under conditions of extreme moisture of this kind, experiments made with balata belting on the washing machines and wringers in this bleachery have proved highly successful. The belts are still in operation and show no ill effects

during eighteen months' service.

On a starching machine in this bleachery a Victor-Balata belt in 6-inch width and 4-ply thickness was installed. The room in which this belt operates is constantly flooded with water. As the embroidery is starched it is run through wringers on the starching machine. The belt and the pulley shaft which operate this machine are on a level with the rollers of the wringer. On this account water filled with starch is constantly being thrown upon the belt which operates it. The slippery quality of wet starch is well known. The belt which operates this machine, however, has given no trouble from slippage of the belt. The belt has not been taken up or shifted on the pulleys since the time it was installed.

Some of the details of the construction of the type of belting described may be of interest. Victor-Balata is neither a rubber nor a canvas belt, though somewhat akin to each. It is claimed to have greater and more lasting waterproof qualities than a rubber belt, to possess more than double the strength a of leather belt, and has the added quality of extreme durability.

It has for its fundamental principle a specially woven 37-ounce duck. The duck is woven under high tension from long-spun, staple cotton. The possibility of stretch in the finished product is therefore reduced to a minimum. It is stated that tests made by the government show this belt has the least stretch.

After the duck is woven, a process is followed which forces into the duck a solution of balata gum, a South American product. Balata gum is not rubber, though it contains the better qualities of rubber without its shortcomings. A rubber belt is well known to deteriorate with age and use on account of the vulcanizing process used in its manufacture. Balata impregnated into a belt acts as a preservative to the duck. In a rubber belt, when the rubber coating is worn away, water rots the cotton fabric. Since balata is impregnated into every fiber of the duck from which belts are made, every portion of the belt, including the duck itself, is waterproofed.

Victor-Balata belt has a tensile strength of 8,800 pounds to the square inch, according to government tests.

Another good point is the non-slip quality in this belt. Victor-Balata does not slip on its pulleys even in extreme conditions of wet and dampness. This is accounted for by the fact that the moment slippage commences heat is generated between the pulley surface and the belt. This friction heat causes the balata gum in the belt to soften just enough to develop its gripping quality, making a belt dressing unnecessary to hold the belt to its work. It is not recommended, however, for work in places where the temperature is above 150° Fahrenheit.

Victor-Balata belt is quite a new factor in the transmission field in this country. For a number of years it has been operating successfully in Europe and other countries abroad. It was less than ten years ago that this belting was first put on the American market. It was brought here by the New York Leather Belting Company, who for several years did not push its sale to any extent, since they desired first to demonstrate to their own satisfaction to just what conditions this belt was best adapted. and has now been able to ascertain by experiment just where this type of belting should be recommended. Under certain conditions leather belting will operate more successfully than this type, but for many other conditions, tests which they have made have shown that Victor-Balata is much superior.

China ranks second in value of cotton goods imported and is exceeded only by British India. The total for this year amounted to $75,303,024.

The exports from Bradford of cloth (of wool or of which wool is a component part), were $77,864,000 in 1860, $107,063,000 in 1882, and $172,760,750 in 1907. There is employed in the textile factories of Bradford a larger number of persons, with the exception of Blackburn, Lancashire, than in any other textile center in the world. At present in the textile factories of Bradford there are over 100,000 persons employed.

E NEW ALMOND GEARED CHUCK.

Thirty years' study in the art of manufacturing ideal chucks, has developed the New Almond geared chuck, which, from a practical standpoint is a decided innovation, with features that prove its ind
nomical value to the user. The new geared chuck—a thoroughly modern product—is a

late offering from the T. R. Almond Co., Ashburnham, Mass., who for a quarter of a century have achieved high-standard excellence in drill chuck manufacture.

Elimination of the defects in the ordinary drill chuck, with the addition of the good features, has added materially to the resourcefulness of the Almond chuck. This chuck affords direct power, bushed pinion holes, interchangeable pinions and increased tightening power, where needed.

The largest step in the path of improvement has been the cutting of the gear teeth on the nut or split ring operating the jaws, which are made of hardened tempered tool steel. The advantages consequent from this may be readily appreciated by those who have had experience with geared chucks with teeth cut on the knurled sleeve.

This experience has been advanced as proof that such chucks depreciate in value to the user, for, after being taken apart several times for cleaning, the ferrule becomes stretched from being forced on and off, with the resultant disadvantage of having it frequently slip on the nut. It has been shown that chucks with teeth cut on the knurled sleeve, made of ordinary steel, lack the durability and strength of the new Almond geared chuck with teeth cut on the split ring made of hardened, tempered tool steel.

Removing the obstacles to perfection in drill chuck building has been the endeavor of the Almond experts, and it has been resulted in pinions that do not break—making replacements unnecessary—and including for convenience sake, interchangeable pinions, that one pinion may be used on both the Almond chucks now manufactured.

To form the teeth on the front side of the nut of the Almond geared chuck, the nut has been increased in diameter. The thrust-bearing area, which withstands the pressure when jaws are forced out to grip a tool, has also been increased two-fold, permitting greater pressure on this surface and the retention of the lubricant for a much longer period.

The troubles that have arisen from the use of ordinary chucks have been obviated by the modern methods employed in the manufacture of the Almond geared chucks. Great durability is assured by the high grade of tool steel used in its construction.

THE HYGROSSO HUMIDIFIER.

Since its introduction the Hygrosso humidifier, manufactured by John W. Fries, 45 Lafayette St., New York, has been installed in a large number of mills where it has done excellent service and given general satisfaction. The success with which it has met mill requirements under widely varying conditions has placed it among the leading types of humidifying apparatus. One of the important advantages claimed for it is the low operating cost, as shown by statements from a number of mills in which it is in operation. The manufacturers of the Hygrosso humidifier have been constantly studying means for increasing the efficiency of the apparatus and have recently adopted some improvements in the construction. One of these is a simple arrangement of piping for supplying the water to the

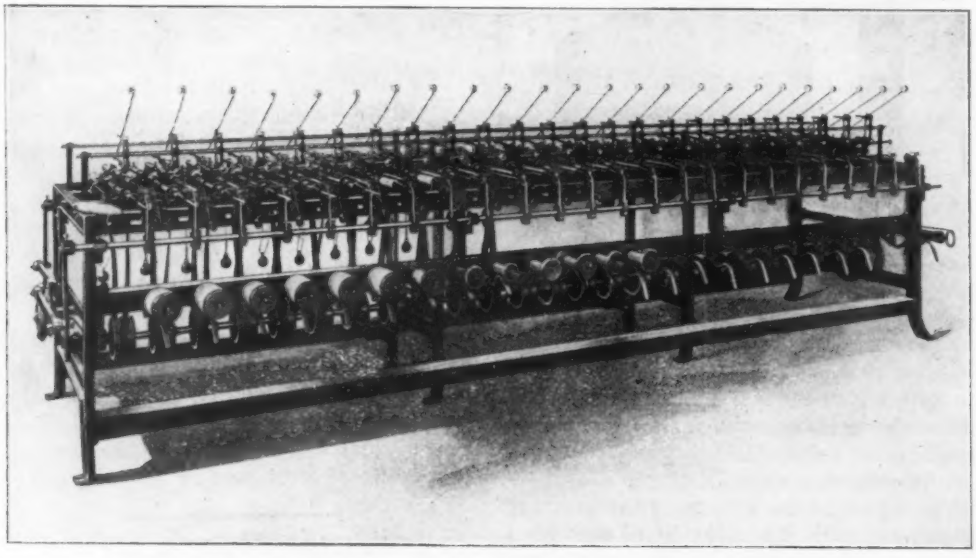
humidifiers in order to insure a constant and even feed to the heads. The new arrangement overcomes any difficulty that may arise as a result of variation in water pressure. It also prevents a flooding of the humidifiers, which might cause a deposit of water on the floor or machinery.

The manufacturer of the Hygrosso humidifiers offers it as the one device of its kind which has all the working parts exposed to view and which requires no opening for cleaning. A special construction for card rooms in which a large quantity of flyings is floating in the air has been developed, which prevents to a great extent the accumulation of the fiber on the working parts of the humidifier.

Among the establishments which have recently installed the Hygrosso apparatus are the following: Banna Mfg. Co., Goldville, S. C.; Buffalo Weaving & Belting Co., Buffalo, N. Y.; John S. Boyd Co., Williamstown, Mass.; Fort Hill Mfg. Co., Fort Hill, S. C.; New Berlin Silk Mfg. Co., New Berlin, N. Y., and the Lowell Textile School, Lowell, Mass.

WINDING AND QUILLING MACHINES.

The Oswald Lever Co., Lehigh Ave. and Hope St., Philadelphia, Pa., are meeting with very gratifying success in placing their winding and quilling machines on the market. This has been due to their practice of adopting every feature that has been shown to be an improvement over previous methods. The latest addition to their line of machinery is the No. 2 Cop butt or quill winder, which is built to suit various kinds of yarn. It is made to wind cops for weaving from the inside or to wind from skeins, spools, mule cops or roving bobbins. It will also make butts to weave from the outside for the manufacture of cotton blankets, duck or cassimeres.



THE LEVER COP, QUILL OR BUTT WINDING MACHINE FOR ALL GRADES OF YARN.

The machine is built to wind on any size of quill with special styles of traverse. It is constructed with iron rails, an automatic stop motion for each spindle, and oilless bearings on the spindle sleeves. The tension can be adjusted to suit any kind of yarn. The machine is very simple and easy to operate.

The Oswald Lever Co. have also recently placed on the market a new hosiery winder

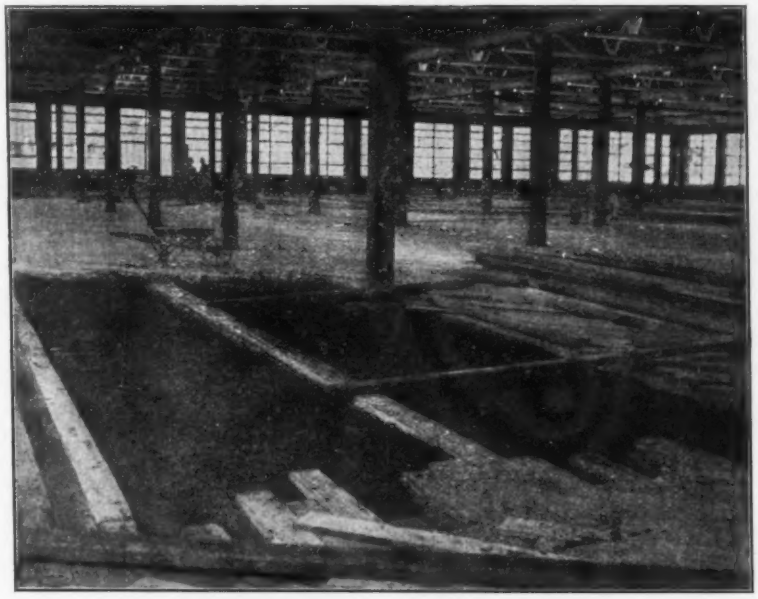
built especially to wind fine mercerized and silk yarn from skeins or cones onto large bottle-neck bobbins. They also build special machines for back winding and a new high speed cross quiller which we described a few months ago. Further information with advice as to the best methods of winding any special grade of yarn will be furnished on application.

AN IDEAL FACTORY FLOOR.

The facility with which mill and other machinery can be fastened to a wooden floor, gives rise to the use of such floors, even when the balance of the floor construction or the necessary strength is obtained from reinforced concrete. The usual method of construction in such cases has been to bed wooden mailing strips in the concrete flush with the surface and nail the floor planks to these strips.

In making the plans for the Blake & Johnson factory at Waterville, Conn., the engineers, Griggs & Hunt, of Waterbury, Conn., were confronted with the requirement of a 4-inch wooden floor on the second story, although the floor panels themselves were to be of reinforced concrete. The usual practice of using nailing strips as mentioned above was at first considered, but there is always danger of dry rot where wood is embedded in concrete, and protection against dry rot was essential.

The method adopted was similar to that used under the lower floor in many factory buildings, and seems so admirably adapted to the requirements that it is strange that it has not occurred to others to use where the wooden floor is required on top of concrete. For twenty or thirty years it has been the practice where a wooden floor is required directly on the ground without space beneath, to omit sleepers and bed the plank directly on from 1 to 2 inches of sand mixed with sufficient good heavy coal tar to fill the voids in the sand. This not only protects against decay that would be caused by dampness from the ground, but the creosote oil in the tar also acts as a wood preservative.



THE BLAKE & JOHNSON PLANT, WATERVILLE, CONN., TAR-ROK FLOOR IN PROCESS OF CONSTRUCTION.

The foundation has often been of concrete but more usually of cinders or broken stone or gravel mixed with enough tar so it would pack well under a roller and provide a level surface for spreading the sand and tar. The mixture of sand and tar provides a perfect bedding for the planks, which are tied together as firmly by the hardwood-wearing surface laid at right angles or diagonally as a single floor would be by the use of sleepers.

This construction for the second floor of the Blake & Johnson factory is shown in the accompanying illustration. In this case the foundation, the reinforced slab, was already in, and all that was needed was something on which to bed the planks. Sand alone would not answer as vibration would cause it to shift; but by mixing tar with the sand this danger was overcome and the protection afforded by creosote oils in the tar was obtained. Barrett's sub-floor tar No. 5 was used and about fifty gallons mixed with each cubic yard of sand.

The mixture was spread on about 1 1/8 inches thick so it could be compressed to 1 inch, then level with a straight edge, and while it was still warm and soft the planks were laid on it and tamped until the proper level and stability were obtained. 7/8-inch rough pine boards were laid on the planks and then a surface of 1 1/4 square edge maple. If the experience of twenty or thirty years counts for anything, the planks in this floor will last as long as any part of the building, and if the hardwood wearing surface wears through in places, repairs will be a simple matter.

The exports from Bradford of cloth (of wool or of which wool is a component part), were $77,864,000 in 1860, $107,063,000 in 1882, and $172,760,750 in 1907. There is employed in the textile factories of Bradford a large number of persons, with the exception of Blackburn, Lancashire, than in any other textile center in the world. At present in the textile factories of Bradford there are over 100,000 persons employed.

REFERENCE INDEX FOR NEW MACHINERY, PROCESSES, ETC.

The following is a brief abstract of New Machinery and Processes which have been illustrated and described in this department during the preceding six months. It does not include the foreign items or American devices of which only brief mention has been made. Those desiring copies of the issues in which these appeared may obtain them if in print by remitting 25c. State plainly the article or articles desired.

Two Speed Drive for Hosiery Ribbers. A two speed drive which is entirely automatic and claimed to increase production 30 per cent.

A Pneumatic Beetling Machine. A pneumatic beetling machine embodying an entirely new principle.

Hank Twister for Worsted Yarn. Performs work in an easier and more speedy manner.

Return Trap System of Boiler Feeding. A trap for returning the hot water of condensation from heating, drying or cooking systems directly to the boilers.

Belting. A belting made from selected packer and foreign hides for long life and hard usage.

Machine for Attaching Labels. A pointed staple label wire stitching machine which penetrates the fabric without cutting thread while passing through.

Bleach for Artificial Silk. A hypochlorite of sodium process produced electrolytically for the bleaching of artificial silk and other fibers of this kind.

A Thread Lubricator. A thread lubricator for knitting and sewing machines which is very simple and efficient.

Automatic Sweater Machine. A new take-up which can be applied to all plain and automatic body sweater machines.

A Slit Drum Winder. A new machine designed for winding silk, schappe, artificial silk, cotton, wool, jute and mohair yarns.

Steel Lockers for Textile Mills. Durable and economical in respect to space and first cost.

A Skiving Machine. A new skiving machine to be used in the manufacture and repair of belts in mills.

Paint for Textile Mills. A mixing of special paint for use in mills that is claimed to effect great saving in artificial light expenses.

Head for Loom Beams. An adjustable head for loom beams which can be put on without taking the beam apart.

Shrinking and Finishing Woolens and Worsteds. A process of water treatment as distinguished from steaming.

Lustering Machine. A machine for increasing the luster of mercerized cotton and to impart a soft, silklike handle and appearance to the yarn.

A Raw Stock Dyeing Machine. An automatic circulating dyeing machine for raw stock which includes a number of important improvements.

A Shuttle Threader. Obviates the objectionable sucking of the thread through the shuttle eye by the weaver.

An Improved Tie. An improved bundle-tying device which is very simple in construction.

Cloth Sponging and Shrinking Machines. A system of machines for sponging and shrinking cloth by the cold water process.

A Brush Holder. An improved metal holder for bristle stretcher.

Bobbin Stripping Apparatus. An apparatus for stripping the waste from pirns, bobbins and roving tubes.

A Corduroy Cutting Machine. Adapted to narrow or wide cords and light and heavy qualities.

A Bobbin Winder. A new metal bobbin winder for transferring yarn from spools on to either bobbins or cops.

An Automatic Loom. A loom designed to perform mechanically almost identically the same operations that the weaver does by hand.

A Crabbing Machine. Embodies many features that have proved to be desirable in this class of machines.

A Loom for Weaving Woolen and Worsted Goods. Simple in construction and designed to increase production. Embodies new features.

A Warp Measuring Machine. A machine which does away with defective marking of the warps and divides the warp into cuts of any desired length.

Cloth Shrinking and Finishing. A process which consists of the direct application of water to the fabric for the purpose of shrinking and finishing.

A Dyeing Process. A new system of dyeing which provides a complete dye house in one machine.

A New Oil Pump. An oil pump which has several new features that commend it to users.

Expelling Electricity from Fabrics. A mechanical system of getting rid of electricity in materials and fabrics during the process of manufacture.

Lighting for Textile Mills. A system of lighting claimed to effect a saving of over 60 per cent. in the current consumption.

High Speed Air Compressor. The leading feature of this compressor, aside from its high efficiency, is the simplicity of construction.

A Pick Arm Strap. A new pick arm strap for the shackle, stirrup or pick arm of looms.

Recovery of Mercerizing Caustic. A machine for the concentration of wash waters and the recovery of caustic soda.

An Arc Lamp. An intensified enclosed arc lamp which marks a distinct advance in the field of interior illumination.

Beaming Direct from Spools to Beam. A beamer designed to meet the demand for a warper that will take the yarn direct from the spool to the loom beam.

A Single Beater Finisher Picker. A new single beater finisher picker claimed to give remarkable evenness to the finished lap.

A Thread Counter. An instrument which offers great advantage in the counting of threads in fabrics over the ordinary thread counters.

A Spool Truck. A new model spool truck designed for use in large mills.

A Horizontal Cell Drier. Improvement in horizontal cell drier which is in many respects a departure from the vertical type previously built.

A Slow Speed Exhaust Fan. An exhaust fan which has been designed and built to meet the requirements of small consumption of power and reduce wear and tear.

Belting for Textile Mills. Showing what types of belting are best adapted for various types of textile mill work machinery.

A New Skein Winder. A new skein winder for wool, worsted and cotton yarn.

Dyeing and Washing Machine. An oscillating type of dyeing and washing machine which is specially adapted for knit goods.

A Carbonizing Equipment for Piece Goods. A carbonizing equipment which saturates and carbonizes the cloth with uniformity.

A Metal Protected Spool. A metal protection applied to a spool which protects the yarn as well as the spool.

An Improved Welding Process. A compound for brazing broken castings which will make them stronger than before they were broken.

An Electric Cloth Cutter. A machine embodying an automatic system of lubrication and which can be run at a very high rate of speed.

The Diesel Engine. An engine which will develop 100 h. p. per hour by using only 6 1/2 gallons of crude or fuel oil.

A Yarn Inspecting Machine. A machine which makes it possible to detect any inequality in the yarn at a glance.

A Bobbin Winder. A machine which covers a wide range of work at a minimum cost.

Cloth Boards as a Means of Identification. Boards with ends papered and stamped with the desired identification mark, which can be plainly seen by the purchaser of the goods.

Uniform Humidity. The Differential Hygrostat for controlling humidity.

The Chapman Gravity Spindle. A gravity spindle which does away with any vibratory shock which might tend to loosen the bobbin.

Bobbins for Automatic Looms. Eight patterns of filling bobbins most frequently used.

Hydraulic Testing Machine. A machine which is operated by water flowing from a tank into a can on the scale beam.

A Tandem Fulling Mill. A fulling mill which can be operated at a high rate of speed, thereby greatly increasing the production.

A Lace and Edging Machine. A machine for the manufacture of lace, edgings and trimmings for underwear.

Full Fashioned Hosiery Machine. A full fashioned hosiery machine which embodies many important improvements.

A Sewing Machine. A machine for trimming and over-edging knit goods.

Dyeing, Bleaching, Printing, Etc.

STRIPPING SHODDY MATERIAL AND BLEACHING UNIONS.

BY DR. LOUIS J. MATOS.

The art of stripping shoddy, while apparently easy to acquire, is nevertheless involved with certain difficulties. In the first place, there are seldom two lots of shoddy or shoddy material that will respond to the same test when applied to stripping. It is a matter of frequent occurrence that in the grading of shoddies, cloths are produced which have identically the same appearance, but which under the influence of stripping agents yield results widely different, this being due to the different effect of dyes upon the material of which the shoddy is composed. This condition of affairs renders it difficult for the dyer to decide upon a method of treatment, and in the absence of a few preliminary trials, it is practically impossible to make a proper selection of a stripping method.

It sometimes happens that a treatment with sal soda will be found sufficient to remove enough color from the goods to enable the dyer to produce a reasonably clear shade. This method will be found of interest where the shoddy cloth is already a light or medium shade. The process consists of working the goods in an ordinary cloth dyeing machine or in an ordinary kettle provided with a winch for half an hour at a temperature of about 120° F., the batch being charged with 5 to 10 per cent. of sal soda. After running, the goods are given a thorough rinse to remove the excess of soda when they are ready for dyeing. This method of treatment is also useful in the dye house when pieces have been overdyed, although it is better to prevent overdyeing than to attempt its correction.

In some cases, the soda treatment fails to clear up the shoddy sufficiently, and then the use of chrome is to be employed, for which the following method is suggested. The goods are boiled for 1/2 to 3/4 hour in a batch containing:

Bichrome	5%
Oil of Vitriol	8%
Oxalic Acid	4%

The cloth should be kept in slow motion. At the completion of the boiling, rinse well, neutralize with weak soda or ammonia, and finally rinse.

Some grades of shoddy may fail to respond to this treatment, in which case the use of hyraldite or similar sodium bisulphites is to be suggested. Ordinary wooden vats are employed, and copper should be avoided. The bath is charged with from 2 to 4 per cent. of hyraldite and from 2 1/2 to 5 1/2 per cent. of commercial formic acid (or 1 to 2 1/2 per cent. oil of vitriol), calculated on the weight of the goods to be stripped. The cloth is entered at about 110° F., the temperature raised gradually to the boil during 1/2 hour, and boiling continued for an additional 20 to 30 minutes, after which the goods are lifted, washed, neutralized if necessary, again rinsed, when they are ready for dyeing. On certain shoddies, the action of formic acid appears to offer advantages over the use of oil by vitriol and vice versa, and only a preliminary trial can determine which acid is the best to use on a given stock.

The bleaching of unions is a matter of growing importance on account of the very wide range of shades now, and likely in the future to be produced on such material, and also on account of the immense quantities of mixed cloth used to take the place of what was formerly all-wool material. The bleaching process generally used is the "sulphur house," familiar to every one. It is necessary to observe, however, that the best bleach upon such cloth can only be secured upon clean goods, and especially on cloth free from traces of soap.

The ideal bleaching process is by means of either the hydrogen or sodium peroxide. With the former, the bath should be prepared by diluting 1 part of peroxide of hydrogen with 5 parts of water in a clean

wooden vat, making it slightly alkaline with ammonia (testing with red litmus paper), heating to 110° F., and allowing the goods to soak for 6 to 8 hours, or over night, completely covered with the bleaching solution. In the morning, lift, sour lightly, rinse with water containing a few grains of bisulphite of soda per gallon of wash water, and finally rinse well.

In using sodium peroxide, each 10 gallons of bleaching liquor is prepared with 10 1/2 ounces of oil of vitriol, to which is slowly added while stirring, 8 ounces of the peroxide. The bath is then made slightly alkaline with ammonia, heated to about 110° F., and the bleaching commenced and finished as described for peroxide of hydrogen.

Owing to the continued prevalence of pastel shades in union cloth for ladies' wear, the bleaching of this kind of cloth is destined to become a feature in many mills not heretofore manufacturing this class of fabrics.

RECENT VAT COLORS.

BY A. B. STEVEN, B. SC.

In the Journal of the Society of Dyers and Colorists.

The vat dyes as a class are characterized by the fact that they are insoluble in water or any other solvent suitable for use in dyeing. By treatment with reducing agents they may, however, be converted into "leuco compounds" which dissolve in alkaline liquids.

The typical vat dye is, of course, Indigo $C_{16}H_{10}N_2O_2$; this is insoluble in water, but on treatment with reducing agents it absorbs two atoms of H and is converted in the leuco compound Indigo White $C_{16}H_{12}N_2O_2$, which is soluble in alkalies, such as lime or caustic soda.

If wool or cotton be immersed in these alkaline solutions the leuco compounds are absorbed by the fiber, and on removal from the vat and exposure to the air the oxygen of the latter removes the added atoms of hydrogen and regenerates the original insoluble dye, which remains fixed on and in the fiber.

The most important reducing agent for the new vat dyes is sodium hydrosulphite $Na_2S_2O_4$. In presence of caustic soda this reduces the dyes to their leuco compounds, which dissolve in the caustic soda to form the dye vats. The usual method employed for dyeing with all the dyes of this class is to first reduce the dye to the leuco compound by treatment with hydrosulphite and caustic soda, either cold or more usually hot. This is done either in a strong "stock" vat, which is then added to the dye bath proper, or else in the dye bath itself. The dyeing takes place either cold or at a moderately high temperature (100°-140° F.), according to the particular dye used. The material is entered and worked for one-half or one hour, usually below the surface, then lifted, squeezed, and allowed to oxidize in the air, after which it is rinsed with water, soured with acid to remove the alkali, and finally soaped hot or boiling to develop the color to its full extent.

The vat dyes are suitable for dyeing vegetable fibers, and a considerable number can also be used for wool and silk. In calico printing many of them can be used for a large number of styles, the methods of application being essentially similar to those employed for indigo. As a general rule the dyeings on cotton are noticeable for their very great fastness to light, washing, chloring, acids, alkalies, cross-dyeing, etc., on which account they are very useful for dyeing cotton material which has to answer high requirements in this respect, e. g., curtains, blouse and shirt material, upholstery goods, embroidery yarns, handkerchiefs, etc.

For some years after the discovery of processes for manufacturing artificial indigo on a commercial scale, the only dyes brought out of the same class were a few bromine derivatives of indigo, such as indigo M.L.B./R and RR. and indigo B.A.S.F./R and RR., which give redder shades than indigo. Besides these, two other dyes soon appeared, indigo M.L.B./T and indigo B.A.S.F./G. These are apparently Methyl indigoes and yield shades greener than those given by indigo itself and faster to chlorine. These products have been in use for a number of years, and are therefore rather outside the scope of this paper, but another series of

bromine derivatives of indigo has appeared in the last few years.

The first of these to be placed on the market were Ciba Blue B and 2B (S.C.I.) = di — and tetrabrom. Indigo respectively. These products give a much brighter and purer blue than indigo. They are suitable for cotton and wool dyeing and also for calico printing. The shades obtained are very fast. Ciba blues may be printed by the glucose or hydrosulphite method; they can be discharged with chlorate and can be used with hydrosulphite NF as color discharges on Para Red, etc. During the past year Meister, Lucius & Bruening have brought out a series of Brom indigos ranging in shade from a bright blue to a greenish blue resembling Methylene Blue. These are Indigo M.L.B./2B (Dibrom Indigo), M.L.-B./4B (Tetra-brom Indigo), Indigo M.L.-B./6B (Penta-brom Indigo) and Indigo M.L.B./5B, which is intermediate in shade between the 4B and 6B brands. They are all suitable for cotton dyeing and printing, and also for silk dyeing. The 2B and 4B can also be dyed on wool. They are very fast dyes.

Printing.—These products can all be printed by the hydrosulphite method, and the 2B and 4B also by the glucose method. Chromate and hydrosulphite discharges are not satisfactory, but chlorates give a good white with the 2B and 4B brands.

The Badische Co. have also introduced some blues of the same class, namely, Indigo RB and RBN, and the Bayer Co. have Brom Indigo FB (Tetra-brom Indigo). All these give very fast bright blue shades.

THE INDANTHRENE DYES.

These have no chemical connection with indigo, being mostly produced from anthraquinone, which is also the parent substance of the alizarin dyes. The first of these dyes was brought out by the Badische Co. in 1901, and since that date the same firm have produced a whole range of shades, varying in shade from a yellow to a black. They are chiefly important for cotton dyeing and printing, the large amount of alkali that they require preventing their use for wool. The following are the brands in use: Indanthrene Yellows G and R, Indanthrene Gold Orange, Indanthrene Orange RT, Indanthrene Copper R, Indanthrene Reds G and R, Indanthrene Claret, Indanthrene Blues GC, GCD, RS, RC, Indanthrene Violets R, RR, RT, Indanthrene Dark Blue BO. The above are fast to washing, light, and chlorine. Indanthrene Grey B, Indanthrene Maroon R, Indanthrene Brown, and Indanthrene Green are fast to light and washing, but not to chlorine. Indanthrene Olive is fast to washing, not so fast to light and chlorine as the blues. Indanthrene Black is very fast to washing, light and chlorine.

THE ALGOLE DYESTUFFS.

During the last few years the Bayer Co. have introduced a series of Algole colors, which are also chiefly derivatives of anthraquinone. The chief brands are: Algole Yellows 3G and R; Algole Orange R; Algole Scarlet G; Algole Red B, 5G; Algole Grey B, Algole Blues CF, 3G, K; Algole Pink R; Algole Green B; Algole Bordeaux 3B.

These are all exceedingly fast to light, washing and chlorine, except the Scarlet, which is good to washing, the Blue CF which is only fair to chlorine, and the Blue 3G and Green B which are unsatisfactory towards chlorine. The Pink is absolutely fast to chlorine. The Blue K is very suitable for producing greens with the Yellow 3G. Besides these colors the same firm have Leucole Dark Green B and Leucole Brown B, which are both inferior to chlorine.

At present the above are only recommended for cotton dyeing and, in some cases, for printing.

THE THIOINDIGO DYESTUFFS.

This series of dyestuffs is of great interest from the chemical standpoint. They are all closely allied to a dyestuff called Thioindigo Red, which was brought out in 1906 by Kalle & Co. Its chemical structure is identical with that of indigo, except that the two NH groups in the latter have been replaced by S atoms.

Thioindigo Scarlet is Indirubin with one NH group replaced by S.

Since then the same firm have produced two other brands of Scarlet G and GG, and also a Thioindigo Violet.

These colors are suitable for dyeing wool and cotton, and also for printing, and give fast shades.

Another color of the same class is Vat Red B of the Badische Co. It gives bluish-red shades of good fastness to light, washing, chlorine, etc. It is suitable for wool dyeing and also for cotton dyeing and printing. It may also be dyed on cotton from a cold sodium sulphide vat.

HELINDONE DYES.

During the last year Messrs. Meister, Lucius, and Bruning have produced a range of colors under the above name which are apparently derivatives of the Thioindigo class.

The chief brands at present on the market are: Helindone Red 3B, Helindone Orange R, Helindone Yellow 3G, Helindone Scarlet S, Helindone Fast Scarlet R, and Helindone Brown G. These all give extremely fast shades on cotton and can also be used on wool and silk, excepting the Yellow 3G and the Scarlet S. The dyeings on wool are fast to light, milling, etc. They can be combined with Indigo to give mixed shades. The Fast Scarlet is a good substitute for cochineal in wool dyeing. They are all suitable for cotton printing by the hydrosulphite method. As a class they cannot be discharged by the usual agents and are therefore suitable to form colored discharges.

CIBA AND CIBANONE DYESTUFFS.

These last series of vat dyes are produced by the Society of Chemical Industry, Basle.

As previously mentioned, the Ciba Blues are brom-indigos, the remaining Ciba colors being derivatives of the Thioindigo class. The Cibanones are anthraquinone derivatives, and are only suitable for vegetable fibers, whereas the Cibas can be also applied to animal fibers.

The chief brands are Ciba Heliotrope, Ciba Bordeaux B, Ciba Red G, Ciba Scarlet G, Ciba Grey G and B, Ciba Green G, Ciba Violets BR/3B, Cibanone Yellow R and Orange R, Cibanone Browns R and U, and Cibanone Blacks.

As a class, these colors are very fast to washing, light, chlorine, etc.; the green is said to be specially fast to chlorine. The Ciba dyes are easily applied in printing, either by the glucose or hydrosulphite method. They are not discharged by chlorates or chromates, and are therefore suitable for colored discharges.

SPECIAL WOOLEN FINISHING.

(From Dyer and Calico Printer.)

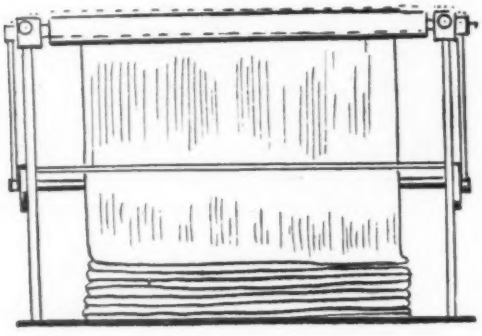
CUT FIGURES.

The first finish described in this article was in use long before embossing; this process was in fact an offshoot of the older finish. Putting the matter in a nutshell, the finish consisted of cutting patterns on the face of a heavily raised fabric. As novelty is the leading feature in textiles generally, and old designs and finishes are continually being resuscitated with new modifications, it would be a bold statement to make that this finish will never be used again. However, apart from this possibility the treatment and mechanisms employed will doubtless be of interest to many finishers, scores of valuable hints having been obtained from processes which are now curiosities.

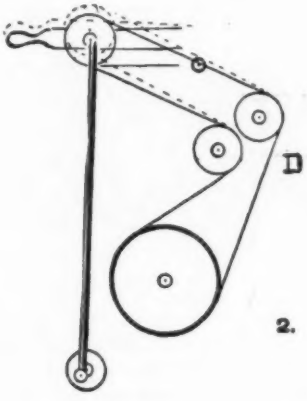
The essential factor in producing a cut figure is a dense velvet nap, thick enough to cover the make of the cloth entirely and to give a bold demarcation between the cut places and the pile. To fill these requirements it will be obvious that only pure wool cloths of the best make can be manipulated with any degree of success, shoddy and union cloths being too poor to lose any of their cover without suffering deterioration. As cheaper and lower cloths came into favor, embossing was substituted for cutting, in order to avoid any waste of wool which the cheaper cloth could ill afford to part with. Careful wet-raising with many adjustments of the strength of the teazles were indispensable in forming a close and compact cover,

this also necessitating a frequent change of ends. If the work was forced or too strong teazles used, the result was a long traily nap through which the foundation of the material could be seen.

nected to each end of the cutters. These alternately raise and lower the cutting parts, clearing out a channel across the fabric each time they descend, while during the ascent the cloth travels through untouched. The



1.



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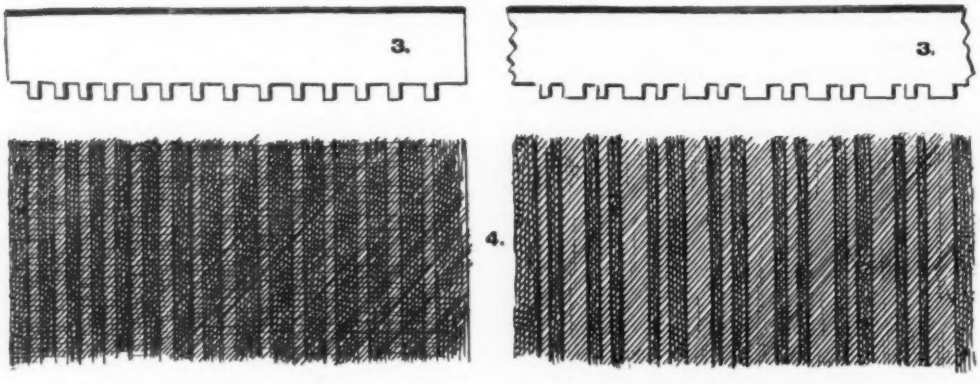


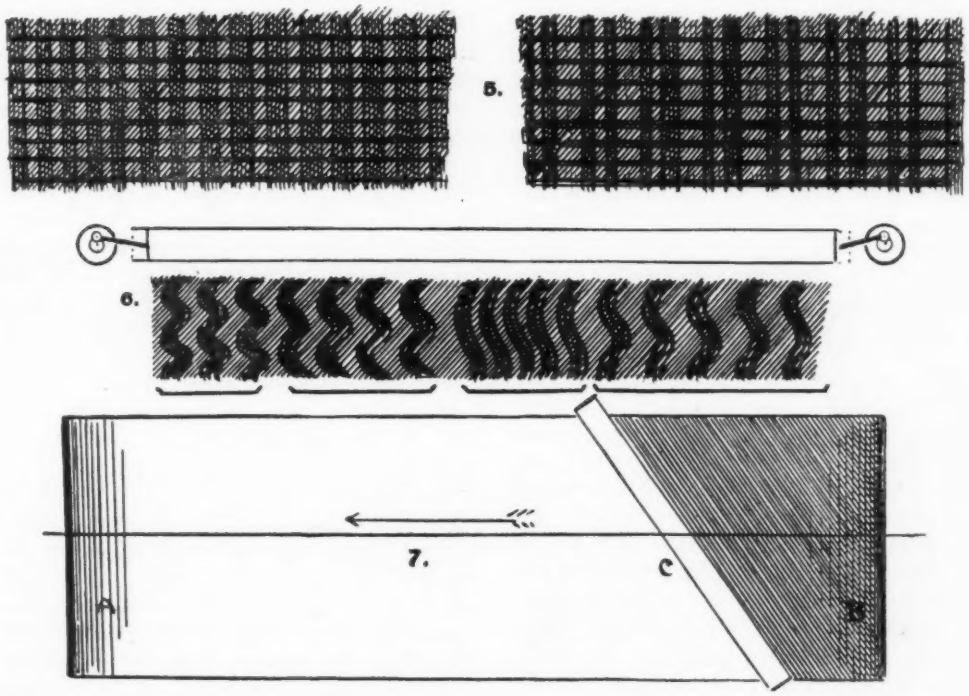
3. 3. 4.

As a general rule, the bulk of the raising was done while the cloth was in the grey undyed state, the finishing touches being given after the dyeing process. When a thick even pile had been obtained, the fabric was tentered, brushed smooth and passed through a cutting machine the type of which is seen in Figs. 1 and 2. This machine, so far as the actual cutting parts are concerned, was exactly similar to an ordinary cutting machine, the cloth traveling through in the ordinary manner. In the two figures, however, the fundamental difference is easily followed, and consists of tappet wheels con-

effect of this is to cut a furrow in the pile from list to list, the distance between each being regulated by adjusting the speed of the traveling fabric together with the rise and fall of the cutters. It will be, of course, quite clear that cutters and blade are held firmly in position by the usual set-screws, the entire cutting mechanism swinging freely from a hinge at either side.

Obviously, the apparatus will cut furrows only at right angles to the warp; to obtain longitudinal ones it is necessary to employ another device. Before dealing with this it may be advisable to point out a small item

seen plainly in the section Fig. 2. In order that the cutters may have a freely reciprocating movement, and yet not interfere with their steady revolution, the driving belt is bent at a sharp angle and carried round two fixed pulleys, D. This, as shown by the dotted lines, permits free movement in response to the tappet motion, while at the same time it keeps the belt tight.



Furrows running warp way may be produced on an ordinary cutting machine, without any reciprocal movement of the cutting parts. The blade against which the spirals work is serrated, more or less space being left between each tooth to regulate the width of stripe. Fig. 3 is a diagram representing two serrated blades with the corresponding design cut in the cloth at Fig. 4. These indentations in the blades required to be at least half an inch deep, not that this depth is essential to allow a free passage of the nap, but to allow for regrinding when the blade grows dull. Cutting action only takes place where the spirals meet the teeth, the adjoining space allowing an untouched ridge of pile to pass through.

Considerable variety can be secured by using teeth of varying sizes, and with larger or smaller spaces between, while combinations of both styles could be obtained by first cutting cross furrows and then adding the longitudinal ones as at Fig. 5. Wavy stripes it would be possible to cut by conferring a reciprocating side to side movement of the toothed blade and cutters, as in Fig. 6. This would naturally give a bolder wave in proportion to lateral movement, and the belt difficulty could be got over, allowing the driving pulley to slide laterally on a groove cut in the cutter spindle.

Fig. 6 shows wavy stripes produced by altering the speed movement, those in the centre of the figure being the result of a slow movement, the others at left and right quick and medium motions. Diagonal stripes were cut by mounting the cutting parts on a modified form of Lewis machine, Fig. 7. Here the cloth is beamed tightly on

roller, A, passing slowly from this on to roller, B. The cutting parts were mounted obliquely across the fabric, giving a diagonal stripe of almost any angle, while each end of the cutters was fitted with levers and tappet wheels, as in Figs. 1 and 2. With this form of machine the cutting was conducted on the lines of a Lewis machine, that is the cloth is stationary while the cutter and carriage traverse the cloth. After the limit of the traverse the machine is stopped, the cutters lifted, and another length of fabric wound from A to B. An improvement on this would be to have the cutting parts stationary and the cloth traveling slowly through, exactly on the principle of an ordinary perpetual.

A NEW PROCESS FOR DYEING WOOL.

An improved method of coloring wool, recently patented, is described by the inventor as follows: The dyeing of wool with adjective, mordant, or lake forming dyes, consists, essentially, in forming upon and within the fiber color lakes of the dyestuffs with metallic oxids. Several methods for producing color lakes upon the fiber are in general use, of which may be mentioned the impregnating of the material with a solution of the salts of chromic acid or chromic oxid, aluminum or iron salts, usually in the presence of certain organic or inorganic acids, from which solutions hydroxids of the metal are deposited upon and within the fiber. The material thus treated is then passed into the solution of a suitable dye, when the color lake is formed by the union of the dye with the metallic oxid previously fixed upon the fiber.

A modification of this method is to first impregnate the material with the dye, which is withdrawn from its solution, and absorbed by the fiber, in the presence of acids, or acid salts. The metallic salt is then added, usually to the same bath,—but sometimes to a subsequent one,—when the color lake is formed as before. Potassium and sodium bichromate are the most important metallic salts used for this purpose, and may be taken as typical ones for the reactions stated.

Certain of the adjective dyes do not immediately form color lakes in the presence of metallic salts. This fact has been taken advantage of to modify and simplify the process of dyeing, in that the metallic salt and the dyestuff may now be added together to the same bath, when in the presence of organic acids, or their acid salts, or neutral salts of ammonium which are easily dissociated by boiling. It is to this latter method of dyeing that the new process is applied.

When the salts of magnesium or those of the calcium group of metals, calcium, barium and strontium, are added to the dye bath, together with suitable dyes and a chromate or chromium salt, the dyeing of wool and other animal fibers is greatly facilitated; the material is very evenly and uniformly dyed; and the resulting color is fuller, richer in tone, and, with many dyes, more permanent.

The reaction which takes place in the dye bath between the magnesium salt,—or a salt of the calcium group of metals,—the dyestuff, and the chromate or chromium salt is not fully determined, but is probably as follows: Weak color lakes are formed by the salts of magnesium and by those of the calcium group of metals—with the dyestuff, which combine with and build up those formed by the principal metallic salt, greatly enhancing its value. The acid liberated from the base of the salt is made available to accelerate the dyeing.

The dyeing operation may be demonstrated by making up a dye bath with a suitable dyestuff, potassium or sodium bichromate, and a quantity of magnesium sulphate, equal to about twice the quantity of dyestuff used. The material is entered, the bath heated, and boiling continued until the dyeing is completed. Besides magnesium sulphate other magnesium salts and the salts of calcium, barium and strontium act more or less favorably.

Example I: To the dye bath containing about 400 gallons of water add two pounds anthracene chromate brown EB, one-half pound bichromate of potassium (or sodium), four pounds magnesium sulphate. One hundred pounds of wool, yarn, or pieces are entered into the bath at 80° to 100° F., the

bath is heated, and boiling continued one to two hours.

Example II: To the dye bath of 400 gallons water add: Two pounds anthracene chromate green B, four pounds magnesium sulphate. Enter into the bath 100 pounds wool at 80° to 100° F., heat, and boil one-half hour, then add one pound bichromate of potassium or sodium, and boil one-half to one hour longer. Additions of dye for the purpose of shading may be made to the dye bath at any time.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 17.

Red on Worsted Yarn.

Hessian Fast Red F on 100 lbs. worsted yarn. Prepare the dye bath with

2½ lbs. Hessian Fast Red F.
(C. Bischoff & Co., 451 Washington St., New York.)
25 lbs. Common Salt.
3 lbs. Acetate of Ammonia.

Enter at 140° F., and dye at a boil for 1 hour. Then add.

2 lbs. Chromium Fluoride

and after treat for 1 hour at a boil.

Hessian Fast Red applied in this way possesses excellent fastness to light and may also be used for dyeing cotton alone or for the dyeing of cotton and wool mixed goods.

Recipe No. 18.

Blue Black on Worsted Yarn.

Diamond Blue Black E B on 100 lbs. worsted yarn. First mordant the yarn with

3 lbs. Potassium Bichromate,
2½ lbs. Tartar,

entering the material at 120° F., bringing slowly to a boil, and mordanting at a boil for 1 1/2 hours. Then dye in a bath made up with

7 lbs. Diamond Blue Black E B.
(Farbenfabriken of Elberfeld Co., 66 Lafayette St., New York.)
5 lbs. Acetic Acid.

Enter the material at 140° F., work at this temperature for 1/2 hour, bring slowly to a boil and dye at a boil for 1 to 1 1/2 hours.

When applied in this way Diamond Blue Black E B will be found to give an excellent shade of blue black which possesses excellent fastness to light, perspiration, alkali, washing, milling, and practically all of the ordinary color destroying agencies.

Recipe No. 19.

Orange on Cotton Yarn.

Pyramine Orange G G on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Pyramine Orange G G.
(Badische Co., 128 Duane St., New York.)
30lbs. Common Salt.
1 lb. Soda Ash.

Enter just below the boil and dye at a boil for 1 hour.

Pyramine Orange G G possesses properties which are characteristic of the direct cotton colors. When coupled with diazotised para nitraniline, reddish brown shades are obtained with improved fastness to washing and cross dyeing.

Recipe No. 20.

Green on Cotton Yarn.

Tetrazo Fast Green B on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Tetrazo Fast Green B.
(American Dyewood Co., 184 William St., New York.)
30 lbs. Common Salt.
1 lb. Soda Ash.

Enter just below the boil and dye at a boil for 1 hour.

Tetrazo Fast Green B possesses exceptional fastness to light for a direct cotton color.

Recipe No. 21.

Blue on Cotton Yarn.

Sulphur Blue B Extra on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Sulphur Blue B Extra.
(6 lbs. Standing Bath.)
(Berlin Aniline Works, 213 Water St., New York.)
20 lbs. Sodium Sulphide.
5 lbs. Soda Ash.
80 lbs. Glauber's Salt.

Enter at 120° F., and dye for 1 hour at a tem-

perature between 120° to 140° F. After the dyeing is completed squeeze the yarn and allow to hank for 1/2 hour, then rinse, soap if desired, and dry.

Sulphur Blue B Extra produces a bright shade of sulphur blue which possesses good fastness to most of the common color destroying agencies.

Recipe No. 22.

Yellow on Worsted Yarn.

Fast Acid Yellow G on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Fast Acid Yellow G.
(Geisenheimer & Co., 189 Front St., New York.)
15 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for 1 hour. Fast Acid Yellow G is particularly well adapted for the dyeing of carpet yarns, as it dyes level and possesses excellent fastness to light.

Recipe No. 23.

Brown on Worsted Yarn.

Anthracene Chromate Brown W S on 100 lbs. worsted yarn. Prepare the dye bath at 160° F. with

4 lbs. Anthracene Chromate Brown W S.
(Cassella Color Co., 182 Front St., New York.)

Dissolve separately, and just before entering the yarn add

2 lbs. Potassium Bichromate,
3 lbs. Magnesium Sulphate,

previously dissolved.

The material should be entered at 170° F., and worked at this temperature for 15 minutes, then brought to a boil and dyed at a boil from 1 1/2 to 2 hours. When the boiling has continued for 1 hour add

3 lbs. Acetic Acid.

Anthracene Chromate Brown W S is characterized by its exceeding fastness to light and acids and alkalies, and in fact to all of the ordinary color destroying agencies.

Recipe No. 24.

Red on Worsted Yarn.

Wool Red S 3 B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Wool Red S 3 B.
(Geisenheimer & Co., 189 Front St., New York.)
15 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for 1 hour. Wool Red S 3 B is particularly well adapted for the dyeing of carpet yarns, as it dyes level and possesses excellent fastness to light.

Recipe No. 25.

Scarlet on Cotton Yarn.

Helindone Scarlet S Paste on 100 lbs. cotton yarn. For 100 lbs. cotton material prepare the stock liquor with

50 lbs. Helindone Scarlet S Paste.
(H. A. Metz & Co., 122 Hudson St., New York.)
12 gals. Water.
11 lbs. Caustic Soda Sol., 40° Be.
5 lbs. Helindoil

and the mixture well stirred, and then add

6 lbs. Hydrosulphite M L B. Conc. Powder is finally added.

The temperature should be kept between 130° to 140° F. until the reduction is complete, shown by the olive green color, and perfect solution.

This liquor should be increased so as to correspond to 20 times the weight of material being dyed. If the water is hard this should be corrected by the addition of 8 to 10 ozs. of soda ash, and 4 to 6 ozs. Hydrosulphite M L B should be added to every 200 gallons of water, the sediment allowed to settle, and only the clear water used. The material is worked in the bath for 1/2 hour. It is then wrung out evenly, and allowed to oxidize in the air. It is then soaped at a boil for 1/2 hour, in a bath made up with 2 parts of soap to 1,000 parts of water.

This is necessary to obtain the brightest scarlet shade.

Helindone Scarlet S Paste yields a brilliant scarlet shade upon cotton which is very fast to light, washing and soaping. It also resists chlorine bleach well.

Recipe No. 26.

Green on Cotton Yarn.

Direct Green G on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Direct Green G.
(C. Bischoff & Co., 451 Washington St., New York.)
30 lbs. Common Salt.
1 lb. Soda Ash.

Enter just below the boil and dye at a boil for 1 hour. Then after treat in a bath made up with

3 lbs. Chromium Fluoride,
2 lbs. Acetic Acid,

boiling for 1/2 hour.

Direct Green G will be found to possess high coloring power for a direct cotton color, and when after treated in this way possesses very good fastness.

Recipe No. 27.

Red on Cotton Yarn.

Hessian Fast Red F on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Hessian Fast Red F.
(C. Bischoff & Co., 451 Washington St., New York.)
25 lbs. Common Salt.
1 lb. Soda Ash.

Enter just below the boil and dye at a boil for 1 hour. Then after treat for 1/2 hour at a boil with

2 lbs. Chromium Fluoride
1½ lbs. Acetic Acid.

Hessian Fast Red F when dyed in this way possesses excellent fastness to light and will dye either cotton and wool alone or cotton and wool mixed goods.

Recipe No. 28.

Blue Black on Cotton and Wool Union Cloth.

Blue Black for half wool G on 100 lbs. cotton and wool union cloth. Prepare the dye bath with

6 lbs. Blue Black for Half Wool G.
(Farbenfabriken of Elberfeld Co., 66 Lafayette St., New York.)
40 lbs. Glauber's Salt.

Enter at 120° F., bring slowly to a boil, and dye for 1 hour at a boil, then allow to remain for 15 minutes in the gradually cooling bath.

Blue Black for Half Wool G is a very level dyeing color with good penetrating power. It possesses good fastness to light and alkali.

Recipe No. 29.

Lilac on Cotton Yarn.

Tetrazo Fast Lilac B on 100 lbs. cotton yarn. Prepare the dye bath with

4 ozs. Tetrazo Fast Lilac B.
(American Dyewood Co., 184 William St., New York.)
10 lbs. Common Salt.
1 lb. Soda Ash.

Enter just below the boil and dye at the boil for 1 hour.

Tetrazo Fast Lilac B possesses exceptionally good fastness to light for a direct cotton color.

Recipe No. 30.

Orange on Cotton Yarn.

Pyramine Orange R T on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Pyramine Orange R T.
(Badische Co., 128 Duane St., New York.)
30 lbs. Common Salt.
1 lb. Soda Ash.

Enter just below the boil and dye at a boil for 1 hour.

Pyramine Orange R T possesses properties characteristic of the direct cotton colors. When coupled with diazotised paranitraniline reddish brown shades are obtained with improved fastness to washing and cross dyeing.

Recipe No. 31.

Brown on Cotton and Worsted Union Cloth.

Fast Union Brown B H on 100 lbs. cotton and worsted union cloth. Prepare the dye bath with

3 lbs. Fast Union Brown B H.
(Kalle & Co., 530 Canal St., New York.
20 lbs. Common Salt.

Enter the cloth at 100° F., work to a boil in 30 minutes, boil 15 minutes, shut off the steam and run for 30 minutes in the gradually cooling bath.

Fast Union Brown B H possesses excellent fastness to light and weather, very good fastness to washing, and good fastness to acids and alkalies.

Recipe No. 32.

Orange on Cotton Yarn.

Rosanthrene Orange R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Rosanthrene Orange R.
(A. Klipstein & Co., 122 Pearl St., New York.)
40 lbs. Glauber's Salt.
5 lbs. Soda Ash.

Enter at 180° F. dye at a boil for 1 hour. Then diazotise in a cold bath made up with

2 lbs. Sodium Nitrite,
6 lbs. Hydrochloric Acid, 32° Tw.

Work in this for 15 to 20 minutes. Then develop in a cold bath made up with

1 lb. Beta Naphthol,
1 lb. Caustic Soda, 60° Tw.,

working in this latter bath for 15 minutes. The material is then washed and dried.

Rosanthrene Orange R when developed with Beta Naphthol gives a very bright reddish orange which possesses very good fastness to washing, acids and alkalies.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

New Mills.

*Georgia, Senoia. Contract for erection of mill building for the Senoia Duck Mill has been awarded to J. W. Menter. The mill will be 94 by 267 ft. We recently reported the incorporation of this company with capital stock of $100,000.

*Georgia, West Point. E. B. Reed, treasurer of the Reed Cotton Mill Co., Ltd., which, as noted recently, will be organized, is conferring with the power companies of Columbus, Ga., in regard to electric power to operate his proposed $500,000 mill. Two thousand h. p. will be required. It is said a site has been secured for the new mill and that construction work will be started at an early date.

*Massachusetts, New Bedford. From 40,000 to 50,000 spindles, with preparatory machinery, will comprise the equipment of the new Kilburn mill, to be located north of the present plant. Henry L. Tiffany, treasurer of the corporation, explains that the increase is necessary in order to make satisfactory deliveries on their increasing business. As noted, the capital stock of the Kilburn mill has been increased from $750,000 to $1,500,000. New shares will be issued at par value of $100 and the present stockholders will be allowed to subscribe for the stock on the basis of one new share for every share held. A cash dividend of 33 1/3 per cent. is to be paid.

*New York, Utica. Construction work is progressing on the buildings of the Utica Fine Yarn Co. located on Erie St.

*North Carolina, Laurinburg. The Waverly Cotton Mills Co. has begun manufacturing with 20,000 spindles and complementary machinery. As noted, the product is 16s to 30s cotton yarns. The plant is driven by electricity.

*North Carolina, North Wilkesboro. It is expected that organization of the Finwin Cotton Mill will be effected soon and details of buildings and equipment will then be determined. The capital stock is $200,000. T. B. Finley of North Wilkesboro and J. Locke Erwin, Concord, N. C., are interested.

*North Carolina, Statesville. Construction work on the plant of the Turner Mills Co., located at East Monbo, is progressing, and at an early date equipment consisting of 10,720 ring spindles and other machinery for manufacturing 40s to 60s single and ply yarns will be installed. This is about 3,000 more spindles than it was originally intended to install. A concrete dam is being built across the river at a cost of $25,000, and will supply power to the Turner Mill and the Monbo Mfg. Co. at Monbo.

*North Carolina, Winston-Salem. Lawrence McRae, formerly treasurer and agent of the Rhode Island Co. of Spray, N. C., is in full charge of the new Inverness Mills Co., previously reported incorporated with capital stock of $200,000. They will build a gray goods mill and equip it with 200 spindles and 300 looms, probably to be driven by electric power. A site of 12 acres has been purchased and construction work will begin soon.

*South Carolina, Columbia. About February 1 construction work will be started on buildings for the new Glencoe Cotton Mill and T. Heber Wannamaker, president, treasurer and buyer, advises that he expects to begin manufacturing about September 15. Five thousand spindles and electric power equipment will be installed. Cotton twines and warps will be manufactured, and employment given to about 100 hands. The product will be sold direct.

*South Carolina, Easley. About March 1 work will be started on buildings for the Alice Mills. It has been decided to begin manufacturing with equipment of 15,000 spindles and 300 automatic looms. E. H. Shanklin is president and J. M. Geer, treasurer.

*South Carolina, Great Falls. A gang of men is building a side track from the Catawba Valley Railway Co.'s tracks to the mill site of the Republican Cotton Mill. Preparations are being made to begin construction work.

*South Carolina, Greenville. F. S. Evans, mentioned in December as the promoter of a new cotton manufacturing company, has secured sufficient subscriptions to insure the successful organization of a $300,000 company to be known as the Panola Cotton Mills. It is planned to erect buildings and install about 10,000 spindles and 200 looms, with steam power plant. Lockwood, Greene & Co., Boston, will prepare plans. Those interested with Mr. Evans are Geo. H. Taylor, Ben McKeller, S. H. McGhee, Frank H. Bush, J. B. Clark and others.

*South Carolina, Lowndesville. There seems to be no doubt but that the cotton mill project will be carried to a successful conclusion. Subscriptions are being received in satisfactory amounts and a $250,000 company will probably be organized within a few months at the outside. J. P. Gossett, president of the Calhoun Mills, Calhoun Falls, S. C., and H. W. Kirby of this place have the matter in charge.

*Tennessee, Erwin. It is announced that O. P. Heath & Co. of Charlotte will develop the water power property and establish a cotton mill. As

noted previously, about 3,000 h. p. will be developed and a $100,000 cotton mill built.

*Texas, Marble Falls. The Marble Falls Cotton Mill Co. has been incorporated with capital stock of $300,000, and organized with the following officers: J. R. Yett, Marble Falls, president; T. M. Dees, Dallas, Texas, secretary and treasurer; J. A. Smith, Charlotte, N. C., vice-president and general manager. The new company takes over the Granite Mfg. Co., and as noted previously will weave ginghams, madras, etc., installing 400 looms for this purpose. A water power and electric plant is being built.

*Texas, McKinney. Plans for buildings to be constructed for the Lone Star Cotton Mill have been completed. They call for a main structure, 379 by 100 ft., with separate power house and dye house. Part of the main structure will be 2 stories high and the remainder 1 story. John L. Hill, an architect of Atlanta, Ga., and J. C. Saunders, treasurer and manager of the Bonham Cotton Mills, Bonham, Tex., are in charge of plans and will look after the construction work. It will be remembered that this is a $200,000 company. J. Berry Burrus is president; J. L. White, treasurer, and W. B. Newsome, secretary.

Enlargements and Improvements.

*Alabama, Huntsville. From $75,000 to $80,000 will be expended by the Lowe Mfg. Co. in increasing the weaving department as outlined in the Advance News of December 24. Work on the proposed addition will begin in a short time.

Canada, New Brunswick, Marysville. Plans for extensive enlargements and improvements to the Gibson Cotton Mill are being considered.

*Connecticut, Taftville. The Ponemah Mills are now having constructed the foundation for a new 1,000-h. p. steam turbine. It will furnish power for the looms in the new weave shed.

*Georgia, Hartwell. Incorporation papers of the Beaver Dam Mfg. Co. have been filed by Bailey Fowler, Elbert Fowler and John M. Wright. The new corporation has capital stock of $125,000 and will succeed the Witham Cotton Mills, having purchased the property from Asa G. Candler of Atlanta. It is understood the plant will be improved.

Georgia, Macon. The Manchester Mfg. Co. has issued $100,000 in bonds for improvements, the nature of which have not been announced. They operate 12,000 ring spindles, producing cotton yarns.

*Kentucky, Louisville. Following the purchase of the property occupied by them, the Puritan Cordage Mills state that in the next six months the capacity of the plant will be doubled, and we understand about 2,500 spindles will be added. The capital stock of this company is $75,000. Charles T. Wolf is president, agent and buyer, and C. L. Sweet is superintendent. The plant is operated by electric power.

Massachusetts, Chicopee Falls. Additional stock to the amount of $100,000 will be issued by the Chicopee Mfg. Co., the proceeds to be used in building a weave shed during the present year. The new building will be 1 story high, 240 by 150 ft. Full particulars of equipment have not been determined.

Massachusetts, Fall River. Construction work has been resumed on the addition to mill No. 7 of the Fall River Iron Works Co.

*Massachusetts, Fall River. S. W. Wilkinson, treasurer of the Stafford Mills, advises that the proposed increase in capacity of No. 2 Mill by the addition of 10,000 to 15,000 new spindles has not been decided upon, but will probably come up for consideration in the near future. As noted, this plan includes the erection of an addition. A new 1800-h. p. engine will be installed.

Massachusetts, Ware. Two new boilers are being installed in the addition to the boiler room of the Otis Co.

Massachusetts, Wilkinsonville. It is rumored that the Army & Navy Cotton Duck Co. has ordered a large number of new looms, some of which will be used for manufacturing worsteds.

New Hampshire, Dover. All the looms in No. 2 Cocheco Mill operated by the Merrimack Mfg. Co. of Lowell have been removed to Lowell and the space thus vacated is being filled with new automatic looms by the Pacific Mills.

*New Hampshire, Nashua. Before the first of February the new picker room of the Nashua Mfg. Co., which has been in process of construction since last fall, will be ready for occupancy.

New Jersey, Passaic. The balance of the stock of the Passaic Cotton Mills is to be offered for sale to stockholders and the plant is to be doubled at once. The authorized capital stock is $100,000, of which $77,000 has been paid in.

*North Carolina, Albemarle. As noted, the Wiscassett Mills Co. will add 25,000 spindles to its equipment, making a total of 75,000 spindles. Mill No. 4, now under construction, will be completed before the end of the month. Fine combed yarns and hosiery are made.

North Carolina, Albemarle. The Efird Mfg. Co. has contracted with the Southern Power Co. for electric power to operate one of its mills. Eventually the steam power plant will be discontinued.

North Carolina, Concord. No. 1 Mill of the Magnolia Mills Co., which has been operated by L. W. Brander under the style of the Hanover Mfg. Co. under a lease, has been purchased by Mr. Brander and he has organized the Brander Cotton Mills Corp. to succeed to the property and business of the Hanover Mfg. Co. The new corporation has capital stock of $60,000. L. W. Brander is president, agent and buyer, and B. A. Ruffin is treasurer. At present 4,000 spindles and 40 jacquard looms are operated on yarns and mercerized damask, and this equipment will be increased by 1,000 new spindles and 60 new jacquard looms. The plant is operated by electric power.

*North Carolina, Fayetteville. The addition to the equipment of the Victory Mfg. Co. comprises 1,800 spindles and 40 new looms, making a total

of 14,350 spindles and 459 looms. No further additions are contemplated.

North Carolina, Monroe. The Monroe Cotton Mills will be operated in the future by electric power.

*North Carolina, Roxboro. A 100 h. p. engine direct connected to a 75 k. w. generator will comprise the equipment of the new power plant under construction for the Roxboro Cotton Mills.

North Carolina, Rutherfordton. The Cleghorn Mills Co., successors to the Levi Cotton Mills, will build an addition to be used for spinning. The enlargement will be 40 by 75 ft. The present equipment is 64,000 ring spindles and 3,200 twisting spindles.

Pennsylvania, Philadelphia. An increase of about 60 looms is planned by the Moss Rose Mfg. Co. They manufacture tapestries and drapery goods and report business as very good.

*South Carolina, Anderson. Within thirty days the Brogon Mills will decide particulars of additional machinery to be installed.

*South Carolina, Central. Machinery will be installed and in operation in the addition to the Isaqueena Mill by March 1. The building is practically completed now. This is a 138 by 100 ft. enlargement, 3 stories high. As noted, 12,000 spindles and 300 wide looms are to be installed.

*South Carolina, Greenville. About 150 looms are being installed in the new mill of the American Spinning Co.

*South Carolina, Spartanburg. The large addition to the Beaumont Mfg. Co. is nearly completed and the prospects are that it will be running by the first of March. Machinery will be operated by electric power, while the other two mills will continue to be operated by steam power.

Mills Starting Up.

*Maryland, Ilchester. There have been delays in preparing the Thistle Mills to begin manufacturing and operations will not be started until January 15. All the buildings have been overhauled and entire new carding and spinning machinery has been installed. Cotton duck and print cloths will be the product.

North Carolina, Asheville. Operations have been resumed in the bleachery of the old Elk Mountain Cotton Mills, now owned by the Asheville Quilt Mills.

Mills Shutting Down.

Alabama, Eufaula. The Barbour Cotton Mills have shut down and the management has given out a statement that the closing is temporary as they are prepared to resume business as soon as the demand for goods warrants profitable returns.

WOOLEN.

New Mills.

*Connecticut, Rockville. The Rockville Worsted Co. has organized with the following officers: Frank E. Weeden, president; Thomas J. Corcoran, vice-president; Edmond Corcoran, treasurer and buyer; Parley B. Leonard, secretary, and T. J. Corcoran, Jr., superintendent.

*Oregon, Portland. The buildings under construction for the Multnomah Mills will be completed by February 1 and manufacturing will begin shortly after that date. A boiler has been received and a 150-h. p. engine is in transit, and expected the latter part of the month. They will manufacture woolens, worsteds and knit goods.

*Rhode Island, Woonsocket. The Samoset Worsted Mills will be incorporated with capital stock of $300,000. Charles L. Harding will be president and Ervin S. Dunn, treasurer. Construction work on buildings will be started as early in the spring as weather conditions will permit.

*Vermont, Winooski. Work on the foundations of the spinning mill under construction for the American Woolen Co. has been completed and a large force of masons has begun work on the brick work.

Enlargements and Improvements.

Connecticut, Danielson. A new engine has been installed by the Danielson Worsted Co.

Connecticut, Staffordville. A number of new looms have been ordered by the Garland Woolen Co.

*Connecticut, Thompsonville. Work on tearing down the old buildings in the mill yard of the Hartford Carpet Co. will be started at an early date, and the proposed new mill will be built as soon as the old buildings are out of the way. Contract for 800,000 brick has been awarded.

*Illinois, Rockford. Work on repairing the plant of Dyson & Platt is already in progress, and the owners expect to resume manufacturing in two months. The loss is not as great as the original estimates, as the plant is only partially destroyed, but will probably reach $10,000.

Maine, Old Town. The loom capacity of the Ounegan Woolen Mill (American Woolen Co.) is to be increased to 57 looms.

Massachusetts, Blackington. Machinery is being rearranged in the Blackington Co.'s mill to make room for new equipment which has been ordered.

*Massachusetts, Globe Village. In addition to the new central power plant to be built by the Hamilton Woolen Co., a large addition is to be constructed to the weave shed. Definite plans have not been prepared.

*Massachusetts, Holyoke. The contractor has started work on the foundation for the new 5-story mill to be built on Bigelow St. for the Farr-Alpaca Co. The building will be a 5-story structure, brick and steel construction, about 150 by 450 ft.

*Massachusetts, Millbury. Carding machinery has arrived at the plant of Molt Bros. from the Riverdale Woolen Co. at Northbridge, which has gone out of business as noted. There will be 5 cards and 2 pickers in this department.

Massachusetts, Millbury. W. W. Windle & Co. will build an addition, extending the present mill 56 ft. This will make an addition 56 by 40 ft., 3 stories high. Scouring, carbonizing, dyeing and garnetting are done. New machinery will be installed.

Massachusetts, Saugus. Additional land has been bought by the U. S. Worsted Co., and it is reported will be used for the proposed extension to the Iroquois Mills to be built in the spring.

Missouri, St. Joseph. The Buell Mfg. Co. have remodeled their entire plant and added some new equipment, including 16 new looms. This plant has been very busy during the past few years. Geo. Dahlenburg is manager, and R. L. Dawson, superintendent.

*New York, Jamestown. Contract has been let by the Ashworth & Odell Worsted Co. for construction work on their proposed new 4-story mill.

New York, Rochester. Six new looms have been ordered by the Allen Woolen Mills, and will be installed as soon as possible. The plant is working full time and is very busy. A. Tait Hope is designer and L. L. Allen is buyer.

*Pennsylvania, Philadelphia. Richard H. Aiman, Inc., recently formed to take over the business of Richard H. Aiman at Coral and Adams Sts., has organized with R. H. Aiman, president; Jerome H. Shelp, treasurer, and Herbert S. Landell, secretary and manager. They manufacture fine woolen and worsted fabrics, operating 40 looms. This equipment is to be increased later.

Pennsylvania, Philadelphia. C. H. Masland & Sons, manufacturers of carpets and rugs at Amber, Westmoreland and Collins Sts., who have been making extensive improvements to their present plant, have purchased two lots, each 17 by 70 ft., on the southwest side of Willard St., east of Collins St., which enables them to make further additions.

*Rhode Island, Allendale. The equipment to be installed in the addition nearly completed for the Allendale Worsted Mills comprises 4,000 new spindles, Bradford system. Henry A. Kirby is president and treasurer; George Darsie is secretary, general manager and buyer, and Wm. Joyce is superintendent.

*Rhode Island, Esmond. The new building being erected for the Esmond Mills will be used for a repair shop.

*Rhode Island, Harrisville. Contract has been awarded by the Wm. Tinkham Co. for their new $75,000 mill. The main building will be 270 by 48 ft., of concrete construction. There will be separate power house, storehouse and dyehouse. This building is to be occupied by the Glen Worsted Mills and the Royal Worsted Mills as tenants. The quarters occupied by these concerns is to be taken over by the U. S. Worsted Co.

*Rhode Island, Pawtucket. D. Goff & Sons are rebuilding their dye house and adding new machinery and will soon be in running order. Everything necessary to replace the loss caused by the recent fire has been ordered. The damage was between $20,000 and $25,000 on buildings, machinery and stock in process.

Rhode Island, Pawtucket. The capital stock of the Lorraine Mfg. Co. has been increased from $3,000,000 to $5,000,000. Extensive additions to the worsted department have been noted.

Rhode Island, Woonsocket. The Hamlet Textile Co. is erecting a new brick engine house and installing a new boiler.

Mills Starting Up.

*Kansas, Topeka. The Western Woolen Mfg. Co. has been granted a charter with capital stock of $35,000, and has begun manufacturing in the plant of the Western Woolen Mill Co. They are operating all the machinery on full time. Previous report of this change has been given.

Massachusetts, Hinsdale. Manufacturing will be resumed at once by the Hinsdale Woolen Mills after a shut down of about six weeks. The stoppage was due to a large stock of finished blankets on hand.

SILK.

New Mills.

New York, New York City. E. & H. Levy, operating plants at Shelton, Conn., Allentown, Pa., and New York City, have purchased land on Purdy and Odell Sts., measuring 300 by 216 ft., and 100 by 200 ft. They will build a new mill on one of the lots, and will move their plants now located at 518 Fifth St. and 1901 Park Ave. into the new building, which it is planned to have ready for occupancy during the summer of 1911. The mill will be 6 stories high, 200 by 300 ft. E. & H. Levy are ribbon manufacturers.

Pennsylvania, Allentown. The Fairview Silk Co., with capital stock of $10,000, is fitting up a plant with 7 looms at Rittersville on which silk hat bands, ribbons, woven shoe laces, etc., will be made. Their present quarters are only temporary as they plan to build as soon as business warrants it. Gustav Laurent is president and superintendent, and Harry Jordan is treasurer.

*Pennsylvania, Lebanon. The new silk mill to be built by Jansen & Pretzfeld of the Lebanon Silk Co. will be an enlargement of the old plant, giving 30,000 square feet additional floor space. It has been reported previously that an independent company would be formed. Work on buildings will be started at once and it is planned to complete the installation of machinery and begin manufacturing by July 1. The equipment has not been decided upon. The products will be plain, fancy and novelty silks similar to the present lines of the Lebanon Silk Co. The new plant will be operated by electric power. E. W. Pretzfeld is president, R. H. Pretzfeld, treasurer, and C. O.

Jansen, buyer. Their New York office is at 121 Spring St.

*Pennsylvania, Northampton. A committee has been appointed by the Allen Silk Co. to receive bids for the construction of buildings, and it begins to look as if they intend to manufacture. The company has capital stock of $50,000. E. H. Laubach is president; D. G. Trumbull of Catasauqua, secretary; Samuel Beil, treasurer. D. G. Dery is one of the directors. A silk throwing plant is proposed.

*Pennsylvania, Riegelsville. A new company will be incorporated under the style of the Riegelsville Silk Co. and will equip buildings formerly operated by the Durham Knitting Mills, Lee S. Clymer, proprietor. Names of parties interested have not been made public, but they are from Paterson, N. J.

Enlargements and Improvements.

Connecticut, Willimantic. The Windham Silk Co. has purchased the large brick manufacturing building at the corner of North and Valley Sts., and after next July when the tenant's lease expires, will occupy the entire building. The three upper floors are now occupied by the Windham Silk Co. This property was formerly used for manufacturing purposes by the Natchaug Silk Co.

New Jersey, Paterson. A perpetual lease has been purchased by the Brilliant Silk Mfg. Co. Inc., on the building occupied by them for the past 12 years, and they will occupy 50,000 square feet of floor space instead of 20,000 and add from 300 to 400 looms. About $55,000 will be spent on alterations to building and as soon as this work is completed new machinery will be installed. They manufacture broad silks on 350 looms. J. B. Whitney is president, treasurer and buyer.

New Jersey, Paterson. The Reliable Silk Throwing Co. has purchased the throwing machinery of the Delhi Silk Co., now out of business, and will combine both plants in the old Strange Mill.

New Jersey, Paterson. Thirty-two new broad looms are being placed in the new Hall Mill by the Diamond Silk Co., and the moving of their plant of 48 looms from the Sawerbut Mill will be started at once.

New Jersey, Paterson. An annex is being started in the Gun Mill by the Demarest Silk Co. The branch plant will consist of 24 broad looms and auxiliary machinery.

Pennsylvania, Philadelphia. Schrack & Sherwood, manufacturers of undertakers' supplies and upholstery trimmings, whose building on Callowhill St. was recently destroyed by fire, have leased two floors in the building at 210-212 North 13th St., which they will equip with machinery for manufacturing the same line of goods.

Mills Starting Up.

*New Jersey, Paterson. Next week the mill of A. & M. Levy, on Totowa Ave., will be reopened by the Miesch Silk Mfg. Co.

MISCELLANEOUS.

Illinois, Chicago. A plot of land south of 35th St. has been purchased by the Boynton Wool Scouring Co. and a new mill will be built. The company expects to occupy the new building about April 1.

*Massachusetts, Lowell. The Merrimack Utilization Co., previously reported incorporated with capital stock of $25,000, will handle waste from four Lowell mills: the Lawrence, Massachusetts, Hamilton and Boott, and will sort, mix, clean and sell. The directors are the treasurers of the above mentioned mills, and the officers are Clifton P. Baker, president; Edward N. Lovering, treasurer; F. A. Flather, clerk; and Arthur L. Sharp, general manager. Samuel H. Roberts, formerly connected with the N. E. Cotton Yarn Co., is salesman. The new company has secured a mill in Tewksbury. The organization of this company is one of the results of the investigation made by the Arkwright Club concerning the disposal of cotton mill waste.

*Massachusetts, Mansfield. The new Mansfield Bleachery Co. expects to begin operations about March 1. About $50,000 has been expended on erecting new mill, boiler house and other buildings.

*Massachusetts, Wareham. Outside work on buildings under construction for the New Bedford & Agawam Finishing Co. has been practically completed and operations will be started about April 1. Steam boilers are being set up in the boiler house. Some of the machinery has already arrived and most of the balance is on the way and expected any day.

Minnesota, Duluth. A spinning department of about 1,000 spindles is to be equipped by the Western Linen Co., also one or two looms will be added for experimental weaving purposes. They claim to be sold up on yarns for the present year. E. H. Smith is president and buyer; J. H. Barnes, treasurer, and A. F. Verier, superintendent.

*New York, Wappinger's Falls. Changes planned by the Garner Print Works and Bleachery Co. involve complete reorganization of the Duchess plant and the Rockland Print Works of Garnerville. As suggested previously, all the printing will be done at the Rockland plant and the bleaching and finishing at the Duchess plant. Large additions will be built and new equipment installed, making the Duchess plant one of the largest bleaching and finishing plants in the country.

*North Carolina, Burlington. The new finishing company will be known as the Keystone Finishing Mill instead of the Keystone Hosiery & Finishing Co., as reported previously. A plant will be equipped for dyeing, finishing, boxing and selling hosiery. This is the project in which we reported John H. Tate of High Point interested last December.

New York, Sammonsville. The Gloversville Welt Co. has been completely destroyed by fire. They manufactured a patent welt used in the manufacture of gloves.

Ohio, Cleveland. About $4,000 damage was caused by fire in the plant of the Cleveland Knitting Mills, 5518-5522 Euclid Ave.

Pennsylvania, Philadelphia. The plant of the Wabash Mills Co., on Nixon St., above Umbria, Manayunk, in which they manufactured wool spun cotton yarns with 12 sets and 2,525 mule spindles, was damaged recently by fire with a loss estimated at $15,000.

*Connecticut, Putnam. Nothing definite can be learned of the rumored plan to establish a small worsted weaving industry in the Fisher boot factory, and it begins to look as if there is nothing in the report.

Connecticut, Stafford Springs. T. F. Mullen & Co. have leased part of the Edward Mann building on Westford Ave. and will remove their narrow looms to the new location.

Connecticut, Stafford Springs. Stockholders of the Crystal Lake Worsted Co., organized by the late Daniel M. Brown for the purpose of doing a mail order business in connection with the Rhode Island Worsted Co., have voted to dissolve the corporation.

Georgia, Flowery Branch. W. W. Cooper is interested in the organization of a company to manufacture rope and twine and would like information on necessary machinery equipment.

Georgia, Jackson. A movement for a $650,000 cotton mill to be located here is being agitated and it is reported option has been secured on a 50-acre tract of land. W. J. Massee, president of the Central Georgia Power Co., Macon, and other Georgia capitalists are interested. It is planned to run the mill by electric power, furnished by the new hydro-electric development, which will generate 20,000 h. p.

Georgia, Macon. Dr. V. K. Osigian, an Armenian, and reported to be an expert in silk culture and manufacture, is trying to interest business men of southern Georgia in a plan to raise silk and establish silk manufacturing plants.

Georgia, Monticello. President Massee of the Central Georgia Power Co., Macon, Ga., is negotiating with the Board of Trade for the establishment of a $400,000 cotton mill in Monticello. It is said preliminary steps have been taken toward the organization of a company.

*Illinois, Elgin. The capital stock of the Western Thread Co. has been increased from $15,000 to $200,000 and the principal office has been removed from Chicago to Elgin. The removal of the plant from Chicago is now in progress.

Indiana, Madison. A charter has been granted the R. Johnson Yarn & Cordage Mills with capital stock of $50,000. The new corporation succeeds to the business of the same name.

Maine, Old Town. Owners of available land for the proposed cotton mill have raised the price on their property and it is said this is in the way of the establishment of the plant.

Maine, Sangerville. The Carleton Mills Co. has been merged with the Sangerville Woolen Co. under the firm name of the latter. The mills will hereafter be under one management.

Massachusetts, Easthampton. A charter has been granted the Geo. S. Colton Elastic Web Co. with capital stock of $300,000. The new corporation takes over the business of Geo. S. Colton. Geo. S. Colton is president and treasurer, C. Louise Colton, assistant treasurer. The above, with Chas. Johnson and Wm. Bassett are the incorporators. There will be no change in plant at present.

Massachusetts, Franklin. The stockholders of the Franklin Felt Co. have voted to increase the capital stock from $80,000 to $160,000 to complete the plant and get working capital. One-half of the new stock will be issued immediately for cash.

Massachusetts, Lawrence. Some of the machinery in the Ayer Mill has been installed and has been started up to make necessary adjustments. Construction work is rapidly nearing completion.

Massachusetts, Lawrence. Additional land has been purchased by the U. S. Worsted Co. near the old Chandler flour-mill site, which was purchased several months ago. It is probable a worsted mill will be built during the summer.

Massachusetts, Lawrence. The Essex Co., which controls the water power at Lawrence, is buying land at Mitchell's Falls in the Merrimac River below the Wood Worsted Mills and the Pacific Mills's new mill site, and this has given rise to the report that a dam is to be built and land in this section utilized for mill buildings.

Massachusetts, New Bedford. Rumors of from two to five new cotton mills to be built in the North End of the city and in the farming districts near the Northwestern section of the city have caused a rush of speculators to secure possession of manufacturing sites. It is said that Wm. Whitman, Pierce Bros., and other prominent mill men will build new mills, also that the Beacon Mfg. Co. will build an addition.

Massachusetts, New Bedford. The Anderson Textile Mfg. Co. will issue $12,500 of the authorized capital stock of the corporation for cash, and the plant will probably be increased. They make novelty tapes, threads and twine for binding.

South Carolina, Wellford. A charter has been granted the Wellford Mfg. Co. with capital stock of $40,000. Vernon Muckenfuss and Wm. Jones of Spartanburg, S. C., are the incorporators. Mr. Muckenfuss is treasurer of the Jordan Mfg. Co. of Wellford.

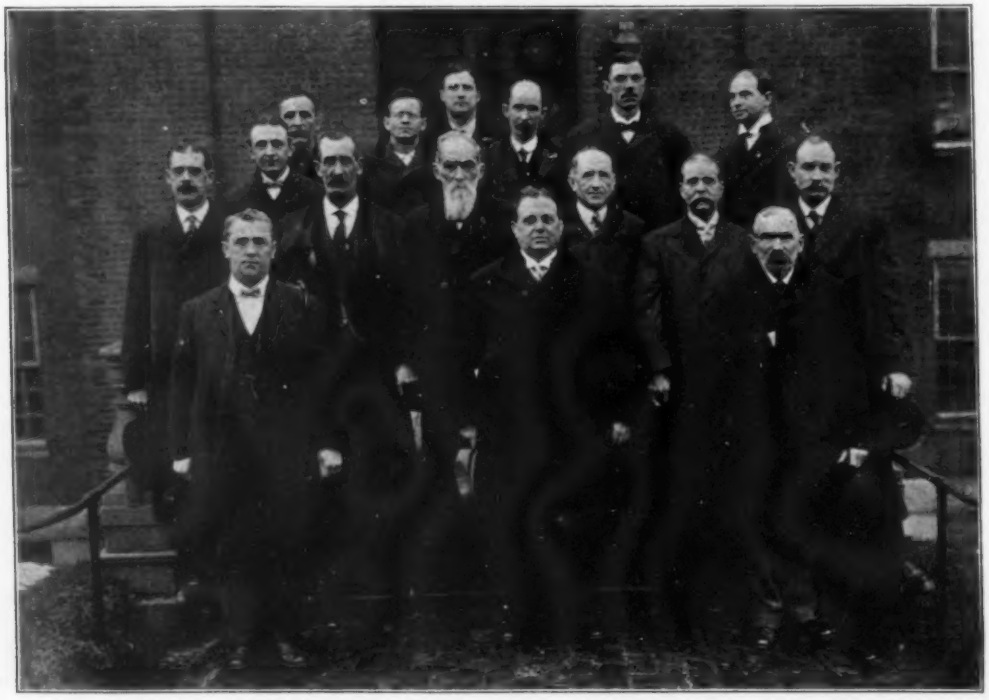
*Texas, Ballinger. John C. Brazelton heads the project to establish a cotton mill here.

Pennsylvania, Allentown. The Lehigh Bleaching & Dyeing Co. will enlarge their plant by the erection of a new building in which machinery will be installed for dyeing blacks on hosiery. This is a new concern which began operations several months ago and has had exceptional success in bleaching knit goods and yarns, dyeing yarn in the skein, making a specialty of the silk trade. The capital stock is $10,000. James Krasley is president; Ervin Krasley, treasurer, and Oliver H. Krasley, superintendent and buyer.

Pennsylvania, Philadelphia. The Charlotte Dye Works, Edward Kagermann, proprietor, will make improvements in their boiler room to cost $800.

Pennsylvania, South Bethlehem. New machinery has been installed in the Austin Dye Works, which were burned out some time ago, and the concern is doing an excellent business, dyeing fast blacks and colors on hosiery. The capacity is 4,000 pounds per day.

*Rhode Island, Alton. The addition to the



SUPERINTENDENT AND OVERSEERS OF THE HILL MANUFACTURING CO., LEWISTON, MAINE.

Left to Right, Front Row—E. T. Wood, F. P. Morrison, Magnus Evans. Second Row—F. E. Wagg, H. B. Ross, D. T. Mitchell, Chas. E. Bartlett, James Linney, F. E. Boston. Third Row—Joseph Marshall, Michael Laughton, Leon Roy, Norman Buchanan. Fourth Row—George S. Scott, O. B. Moyes, Albert C. Martin.

Pennsylvania, Philadelphia. A mercerizing plant will be equipped by the Hulton Dyeing & Finishing Co.

Pennsylvania, Philadelphia. John Bromley & Sons, manufacturers of lace curtains, rugs and carpets at Lehigh Ave. and Front Sts., have placed a contract with a local builder for the erection of an addition to the plant consisting of a two-story and basement building of brick at Somerset, Gurney and A Sts. The building will have a frontage of 222 feet on Somerset Sts., 191 feet on A St., and 294 feet on Gurney St. The operation, which will commence at once, will cost about $50,000.

The Lyman Mills, Holyoke, Mass., have adopted the American Moistening Co.'s system of humidifiers.

Richmond Lace Works is completed and it is stated that new machinery will be added which will more than double the present capacity. The addition is 2 stories high, 220 by 60 ft.

*Rhode Island, Pawtucket. Organization has been completed by the Nonpareil Mfg. Co., with P. Chartier as president, and Noah E. Pion, treasurer, superintendent and buyer. A plant has been equipped for converting yarns and threads.

*Rhode Island, Providence. Dyeing equipment will be installed in the small addition to the Queen Dyeing Co., now under construction.

Calhoun Mills, Calhoun Falls, S. C., have adopted the American Moistening Co.'s system of humidifiers.

*Rhode Island, Pawtucket. Land has been purchased by the Seekonk Lace Co. for their proposed plant. The site consists of 2 1/2 acres of land on Brooks St. Plans are under way for a building of brick construction, 57 ft. wide and 184 ft. long. Henry J. Lynd is president of the Seekonk Lace Co.; James H. Crossley, vice-president; John E. Judson, secretary; Louis Monast, treasurer. W. D. Sowter, who will be in charge of manufacturing, is in England purchasing lace machinery.

Rhode Island, Providence. The Regina Lace Co. has been incorporated with capital stock of $200,000 by Theodore Francis Greene, Arthur N. Allen and Abbott Phillips. A plant will be established for the manufacture of laces.

*South Carolina, Greenville. The Union Bleaching & Finishing Co. has contracted with the Southern Power Co. for 600 h. p. The change to electric power will be made at once.

FAILURES AND SUSPENSIONS.

Pennsylvania, Bridgeport. On the petition of Fowles & Co., wool dealers in Philadelphia, and the estate of Freeland G. Hobson, of Collegeville, Pa., the court has appointed William T. Fowles receiver for the Sterling Mills Co., manufacturers of cassimeres operating 5 sets, 2,500 spindles and 38 looms, with a dye and finishing department. The company whose plant is located at Front and Depot Sts., has a capital of $100,000; Isaac Taylor, pres.; Thomas Taylor, treas. and mgr., and Joseph Hobson, sec.

FIRES.

Iowa, Des Moines. Fire destroyed the plant of the Guaranty Hosiery Mills. Plans for re-equipping their plant have not been made, although R. B. Dennis, treasurer and buyer, is quoted as stating that they will probably seek a new location at once and prepare to begin manufacturing as early as possible. The Guaranty Hosiery Mills operated 56 knitting amchines on hosiery.

Kentucky, Louisville. The wareroom of the Louisville Girth & Blanket Mills was damaged by fire, causing loss of $5,000. There is no loss in the manufacturing plant.

Massachusetts, Adams. Fire in the plant of J. O. & O. J. Purnell caused loss of about $3,500, fully covered by insurance.

Massachusetts, North Adams. A loss of about $2,000 was caused by fire in the napping room of the Windsor Print Works. Very little of the machinery was injured and the plant is in operation.

Massachusetts, Wakefield. Fire in the plant of the Harvard Knitting Mill caused damage to buidings estimated at $1,000 and damage to stock and machinery to the extent of about $15,000; fully insured.

New Jersey, Paterson. Fire in the old Hamil Mill caused loss of $20,000. The Reliance Silk Co. was completely destroyed and the Silk City Warping Co. suffered heavy loss by water. Henry Doherty Silk Co. had slight loss by water.

FACTS AND GOSSIP.

Alabama, Auburn. A mechanical and textile building to cost $40,000 has been authorized by the trustees of the Polytechnic Institute. An extensive textile department will be equipped.

California, Los Angeles. Wittenberg Co., who started the Pioneer Hosiery Mills, contemplate starting a small cotton spinning plant.

*California, San Bernardino. The matter of establishing a cotton mill in this section is in the hands of the manufacturer's committee of the Chamber of Commerce and they are getting together all the data they can relative to the manufacture of cotton goods. Large acreage of cotton is being planted in the Imperial Valley, and they propose to use this raw material. The Chamber of Commerce advises that they hope to get together enough interest to start a large plant, provided the freight rates and the labor supply are such as to enable them to compete with Eastern mills. It will probably be some time before they are able to form definite plans, as the problem is a new one and numerous details will have to be worked out.

*Colorado, Denver. Nothing can be learned as to whether the project of John H. Bearrup of Albuquerque, New Mexico, to establish woolen mills from Denver to the Pacific coast is likely to receive serious attention. The matter has been taken up with the Farmers' Union, National Wool Growers' Association and residents of Grand Junction and Pueblo, Colo. It is said the proposed plan calls for the investment of about $16,000,000.

Colorado, Pueblo. The previously mentioned project of John H. Bearrup, president and treasurer of the Rio Grande Woolen Mills of Albuquerque, New Mexico, to establish woolen mills in this section has been taken up by the Business local investors in a plan to locate one of the mills here.

*Connecticut, Mystic. Some time ago it was reported the U. S. Worsted Co. had bought a mill from the Industrial & Mfg. Co. and would equip it with worsted machinery. This is incorrect. A concern to be known as the American Worsted Co. is negotiating for the building mentioned, but deal has not been closed and probably will not be until organization of the proposed American Worsted Co. has been completed. It has not been learned who is interested in this project.

Connecticut, New Hartford. Machinery is being installed in the Greenwood Mills by J. Spencer Turner Co. of New York for the purpose of experimenting with the manufacture of ramie yarns and cloth. It is understood a secret process is to be tried out. Samuel Digle, a bleacher from Manchester, Eng., is in charge of the work.

Connecticut, Norwalk. Smith & Kauffmann have decided to discontinue their branch plant at this place and machinery will be removed shortly to the main plant at 541 West 132d St., New York City.

Personals.

H. B. McAbee has accepted the position as overseer of spinning at the Holt-Williamson Mfg. Company, Fayetteville, N. C. He comes from Elizabeth City, N. C.

W. J. Wilkes, formerly of Macon, Ga., has been appointed overseer of carding at the Atlantic and Gulf Mills, Quitman, Ga.

Jack Glover has been appointed overseer of weaving at the Monarch Mills, Dallas, N. C.

Edward Bullard has accepted the position as overseer of weaving at the Globe Mills, Gaffney, S. C. He comes from the Cliffside Mills, Cliffside, N. C.

the Batesville Yarn & Card Company, Batesville, Miss.

W. P. Carrigan has been promoted from second hand to overseer of carding in the Dallas Cotton Mills, Dallas, N. C.

C. S. Wright has accepted a position as superintendent of the Echota Mills, Calhoun, Ga. He is a recent graduate of the Georgia School of Technology.

W. A. McKay has been promoted to the position of master mechanic with the American Spinning Company, Greenville, S. C., succeeding P. D. Greer.

AGENT, SUPERINTENDENT AND OVERSEERS OF THE BATES MANUFACTURING CO., LEWISTON, MAINE.

Left to Right, Front Row—Henry S. Adams, Harry T. Goodyear, Fred J. Hodgkins, Alfred J. Platt, John G. Kelley, Supt; Charles E. Scrimgeour, Alexander L. Couper, Robert D. Fraser, William Dixon. Left to Right, Rear Row—Frank A. Channell, Frederick E. Whittle, Colin C. Chapman, Jared P. Wentworth, George W. Meserve, Hartley L. Lord, Agt.; Charles V. Barker, George H. Channell, Clarence C. Brackett, James Gray, James H. Brann.

J. U. Brown has been appointed superintendent of the Grace Mills, Salisbury, N. C. He comes from Fountain Inn, S. C.

G. A. Polatty, formerly of Roanoke Rapids, N. C., has accepted a position as overseer of weaving, slashing and drawing-in at the Tarboro Cotton Mills, Tarboro, N. C.

Edward P. Taft, superintendent of the Capital City Mills, Columbia, S. C., has resigned.

F. G. Parker has accepted the position as overseer of carding at the Edenton Cotton Mills, Edenton, N. C.

Platt Deaver, formerly of Roanoke Rapids, N. C., has accepted the position as overseer of weaving at the Springstein Mills, Chester, S. C.

C. E. Gore has been appointed superintendent of

Robert McKinzey has accepted the position as overseer of carding at the Arlington Mill, Gastonia, N. C.

Otis Ball has been appointed superintendent of the Pepperton Mills, Jackson, Ga.

Leslie Dellinger has accepted the position as engineer and master mechanic at the Daniel Mills, Lincolnton, N. C.

Charles Tanner has been appointed overseer of weaving for J. O. Ballard & Company, Malone, N. Y., succeeding Thomas Fay.

T. Henry Mitchell has been appointed overseer of spinning at the Stroock Plush Co., Newburgh, N. Y. He was formerly engaged by this company and comes from Oswego, N. Y.

Wm. Sanford, designer for the H. T. Murdock

& Company, Proctorsville, Vt., has been appointed superintendent to succeed Louis Anderson, who resigned.

Walter Scott, superintendent of the Stafford Worsted Company of Stafford Springs, Conn., is to sever his connection with that company to accept a position as agent of the Samoset Company, Woonsocket, R. I. Mr. Scott has been connected with the Stafford Worsted Company and the Woonsocket Worsted Company for about twenty-two years.

Charles Safford has been appointed overseer of finishing at the Wassokeag Woolen Mills, Dexter, Me. He comes from Oakland, Me.

Pardon B. Sanford of Utica, N. Y., has taken up his new duties with the N. E. Cotton Yarn Company's mill at Taunton, Mass. Mr. Sanford has been connected with the Utica Knitting Company and the New York Mills for a number of years.

Fred S. Godfrey has been elected vice president of the Wilkesbarre Lace Curtain Company, Scranton, Pa., and succeeds the late Geo. S. Bennett.

Adolph Hoffmann, designer at the Lancaster Mills, Clinton, Mass., has severed his connection with that company to accept a similar position with the Alberfoyle Mfg. Company, Chester, Pa.

SECOND HANDS, BATES MANUFACTURING CO., LEWISTON, MAINE.

Left to Right, Sitting, Front Row—James Cameron, George Brown, William Finn, Joseph Dostie, George Rowe. Left to Right Sitting, Second Row—Lewis Rowe, Alfrado Bubier, August Tilche, Walter Atkins, Charles Wellman, Archibald Weir, Joseph Coutourier, Eugene Dostie, M. Morrow, William Johnson. Left to Right, Standing, Third Row—Frank Meserve, William Scrimgeour, Charles Bedford, Harvey Whitney, Joseph Beaudry, Patrick Mullaney, James Bothwick, Henry Lachance, John Harvey, Martin Ward, Harry Woodhead, Frank Martin, David Allen. Left to Right, Standing, Rear Row—Ralph Howe, August Gagnon, Samuel Shufelt, Edward Finan.

Harry O. Sutcliffe, superintendent of the Bowden Felt Company, Millbury, Mass., has severed his connection with that company.

Bert Le Bar, superintendent of the Paragon Silk Company, Passaic, N. J., has severed his connection with that company to accept a similar position with R. & H. Simon, silk manufacturers at Easton, Pa.

John Carney has been appointed superintendent of the Hayward Felt Mills, Franklin, Mass. He was formerly employed at the Lawrence Felt Mill, Millville, Mass.

Austin D. Boss, son of Gen. E. S. Boss, agent of the American Thread Company, Willimantic, Conn., has been appointed assistant agent and general manager of the local mills. He is 42 years of age, and has been employed for the American Thread Company for a number of years.

Lucius A. Barbour, formerly president of the Willimantic Company, Willimantic, Conn., has been elected president of the Charter Oak National Bank.

Pardon M. Dexter has accepted the position as overseer of spinning at the Androscoggin Mills, Lewiston, Me. He was formerly employed at the Salmon Falls Mfg. Company, Salmon Falls, N. H.

Joseph Feather, second hand at the Brightwood Mfg. Company, North Andover, Mass., has been appointed overseer of weaving.

Benjamin Duce, overseer of weaving at the Brightwood Mfg. Company, North Andover, Mass., has severed his connection with that company to accept a similar position with the Ayer Mills, of the American Woolen Company, Lawrence, Mass.

Jos. Ott, agent of the Royal Weaving Company, Pawtucket, R. I., was the guest of honor at a complimentary banquet given at the Benedict House by the overseers of the Royal Weaving Co. Resolutions were passed complimenting Mr. Ott on the manner in which the employes have been treated during his time as agent.

Edward W. Thomas has been appointed agent of the Boott Mills, Lowell, Mass. In 1883 Mr. Thomas was appointed superintendent of the Tremont & Suffolk Mills, Lowell, and in 1887 he was appointed agent of the same mill. From the Tremont & Suffolk he went to North Carolina and later returned to accept a position as general mill manager of the Consolidated Cotton Duck Company, of Baltimore, Md.

William Smith has been appointed overseer of weaving at the Rockville Worsted Company, Rockville, Conn. He comes from Shelton, Conn.

A. T. Cain, overseer of spinning at the Manetta Mills, Lando, S. C., has resigned.

J. P. McNeil has been appointed superintendent of the Brander Mill, Concord, N. C.

Fred Bagwell has accepted the position as overseer of spinning at the Riverside Mills, Anderson, S. C., succeeding H. W. Hancock, who resigned.

W. B. Locke, master mechanic at the Mills Mfg. Company, Greenville, S. C., has resigned. He will accept a similar position at Pell City, Ala. He is succeeded at the Mills Mfg. Company by C. D. Scott.

R. T. Comer has been appointed superintendent of the Fort Valley Yarn Mill, Fort Valley, Ga. He comes from Cuero, Tex.

C. F. Paxton has accepted the position as night superintendent of the bleachery of the Southern Cotton Oil Company, Charlotte, N. C. He was formerly connected with the dye house of the Highland Park Mills, No. 3, same city.

G. A. Hunt has accepted the position as superintendent and assistant manager of the Granite Mfg. Company, Marble Falls, Tex.

J. G. Rylander, who for many years has been overseer of the cloth room at Manchester, N. H., and at the Boott Mills, Lowell, Mass., has accepted a similar position at one of the mills in Columbus, Ga.

John W. Walters, overseer of spinning and twisting on the night shift at the Dudley Shoals Mills, Granite Falls, N. C., has resigned to accept a position as overseer of spinning at the Manetta Mills, Lando, S. C.

J. H. Harris, superintendent of the Inman Mills, Inman, S. C., has severed his connection with that company.

E. H. Ellenberg has accepted a position as overseer of spinning at the Lion Mills, Douglasville, Ga. He formerly held a similar position with the Union Cotton Mills, Lafayette, Ga.

C. R. Starnes has been promoted to the position as assistant superintendent of the Manchester Mills, Rock Hill, S. C.

Lloyd L. Sykes has accepted the position as designer at the Vassalboro Mills, North Vassalboro, Me. He was formerly employed at the Allen Woolen Mills, Rochester, N. Y.

Samuel Cogswell has accepted the position as overseer of weaving at the Assawaga Company, Dayville, Conn. Mr. Cogswell formerly held this same position.

C. C. Smith has taken the position as manager of the Brainerd & Armstrong Company's silk mill on Golden St., Norwich, Conn. This is a branch of their mill at New London, Conn. He succeeds M. J. Green, who owned and operated the mill until it was purchased by the Brainerd & Armstrong Company.

Michael Norton, overseer of the spinning department of the Hargraves Mill, No. 2, Fall River, Mass., has severed his connection with that company.

J. D. Hammett, president and treasurer of the Brogon Cotton Mills, Greenville, S. C., has tendered his resignation, after one year of service. James P. Gossett, president of the Williamstown Mills, and the Calhoun Falls Mills, has been elected as his successor.

Wm. F. Shaw has accepted the position as superintendent of the Wakefield Mfg. Company, Wakefield, R. I. He was formerly employed at the Assawaga Company, Dayville, Conn.

R. C. Cairus has been appointed overseer of weaving at the Lebanon Woolen Mills, Lebanon, Tenn. He comes from Springfield, Tenn.

David Senior has been appointed boss carder and spinner at the Lebanon Woolen Mills of Lebanon, Tenn. He comes from Nashville, Tenn.

Isaac S. Brooks, overseer of finishing at the Camden Woolen Company, Camden, Me., has severed his connection with that company.

Frank L. Morginson, overseer of the finishing department of the Marston Worsted Mills, Skowhegan, Me., was presented with a beautiful gold watch, Christmas, by the employes in his room as a token of their esteem in which he was held.

Walter Caswell has accepted the position as overseer of weaving at the Concord Mfg. Company, Penacook, N. H. He comes from Central Village, Conn.

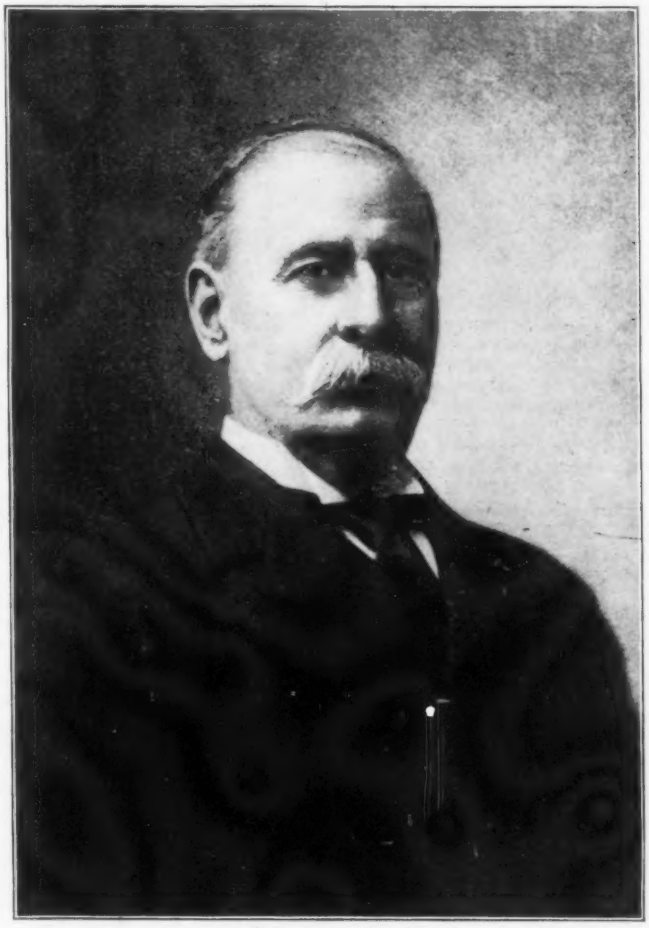
C. W. Rider, assistant agent of the American Thread Company's mill at Holyoke, Mass., has severed his connection with that company.

E. S. Willey, general superintendent of the New England Cotton Yarn Company's Mill at Taunton, Mass., for the past two years, has severed his connection with that company.

J. Frank Dwight has been appointed assistant designer at the Standish Worsted Company, Plymouth, Mass. He is a graduate of the Lowell Textile School.

Gen. William F. Draper.

William F. Draper, one of the best known men in the textile machine building trade, and a soldier and diplomat of distinction, died in Washington on Jan. 28. He was born in Lowell on Apr. 9, 1842, the son of George Draper. After leaving school he worked in machine shops and cotton mills until he enlisted on Aug. 9, 1861, in Company B of the 25th Massachusetts Regiment, a company that his father had been instrumental in raising at Milford, Mass. Young Draper, then only 19 years old, was chosen second lieutenant. He went through the battles of Roanoke Island, Newbern and Fort Macon, being promoted to first lieutenant. He was commissioned captain in the 36th Massachusetts Regiment, joining his regiment after the battle of South Mountain. He went through the Antietam campaign and was at the battle of Fredericksburg, after which he was sent to Newport with the corps. In 1863 his regiment joined Grant's army before Vicksburg, where Captain Draper served until the city was taken. After the surrender he joined in the campaign against Jackson, his regiment suffering severely, being reduced from 650 to 198 in a period of three months. After campaigning for a time in Kentucky and Tennessee, he joined Grant in the Wilderness campaign, where he was severely wounded, being left on the field and taken by the Confederate forces. He was afterwards recaptured and sent to the hospital at Washington. Upon his recovery he joined his regiment at Petersburg, taking command at the Weldon railroad fight. A few weeks later he was wounded at the engagement at Pegram farm, his regiment being the only one of the brigade that kept its organization during the battle. He was breveted



GENERAL WILLIAM F. DRAPER.

colonel and brigadier general for gallent service during the war. Upon his discharge from the service Gen. Draper entered the employ of E. D. & George Draper, and in 1868 became a partner with his father, under the name of George Draper & Son. Upon the death of his father in 1887 he became the head of the company.

General Draper invented many valuable appliances for textile machinery and managed the business of his company for many years with signal success. He served on Governor Long's staff for three years and was a delegate to the national convention that nominated Hayes for president, and one of the electors from Massachusetts who voted for President Harrison. He was elected member of Congress from the 11th Massachusetts district to the 53d Congress, serving two terms. In 1897 he was appointed ambassador to Italy, representing his goverenment for two years, when he resigned his post in July, 1899. A few years before his death he withdrew from the Draper Company, whose success had been so largely due to his efforts.

Josiah Perry died recently at Perryville, Mass., where he was born on March 14, 1832, and where he has been continuously engaged in the manufacture of woolen goods from his early boyhood until his decease. After having worked out of school hours in his father's mill, Josiah became overseer of weaving in 1852, and in 1858 was placed in charge of the mill as superintendent. From the death of his father in 1863 the business was carried on by Josiah and his brother, Charles H., under the name of Joseph H. Perry's Sons, until the death of Charles in 1869. During the forty years since that date Mr. Perry has been sole proprietor of the mill and taking an active part in the management up to within a few days of his death.

Mr. Perry was undoubtedly the oldest woolen manufacturer in America. The village of Perryville is a superior type of the New England factory village. The ownership of the property has continued for one hundred and thirty-six years in one family. The friendly relations of those early days, when the mill owner and employe worked side by side, have been retained up to the present time. This has been due in large measure to the character of Josiah Perry, who, naturally of a kindly disposition, had acquired a complete sympathy with the mill operatives because of having been one of them, learning of their needs and their difficulties by actual experience in mill work. Mr. Perry was a plain, unassuming, companionable man, and to every one who has worked for him or been associated with him his death will bring the sense of personal loss. He served in the State Legislature and was presidential elector, casting his vote for William McKinley in 1900. He was one of the organizers of the First National Bank of Webster, of which he has been president for the past ten years. He was a trustee of the Five Cent Savings Bank of Webster, and treasurer of the Merritt Woolen Co., Webster. He leaves two daughters, Mrs. Eben G. Parsons and Miss Anna L. Perry, and five grandchildren.

John S. Crane, president of the Crane Mfg. Co., Lakeport, N. H., died at his home on January 20. Mr. Crane was born in Ware, Mass., in 1834. When a young man he took a trip around the world and then learned the machinists' trade at Salmon Falls. He became superintendent of a sewing-machine factory at Lawrence and in 1857 was employed at Lakeport in the hosiery business. In 1862 he, in company with William Pepper, began the building of knitting machines, Mr. Crane becoming sole owner the following year. In 1872 he engaged in the manufacture of circular knitting machines under the firm name of Crane & Peaslee, which in 1878 was changed to J. S. Crane & Co. In 1890 the business was incorporated under the firm name of the Crane Mfg. Co.

In politics Mr. Crane was a Republican and represented Laconia in the Legislature in 1875 and the town of Gilford in 1878. He was vice president of the Laconia National Bank and a 32 degree Mason. He is survived by his widow and two grandchildren, Mrs. E. J. Coleman and Mrs. Guy M. Tetley, and by one sister, Mrs. Francis S. Joyce.

The death of Mr. Crane will not cause any interruption in the business of the Crane Manufacturing Co.

Thomas Beatty died very suddenly on Dec. 24th. He was born in Glashiels, Scotland, sixty-three years ago and came with his parents to this country when but two years of age. For many years his home was in Troy, N. Y. When a young man he entered upon his life's work, that of manufacturing woolens, and lived at Camden, N. J., for a number of years. He was later made manager of the old Town Woolen Company, Old Town, Me., a position he resigned in 1900 to take the position of superintendent of the Ounegan Woolen Mills of Old Town. He had recently been traveling through New England for a Boston firm dealing in mill supplies.

Louis Dexter died at the home of his sister, Mrs. Sarah D. Kimball, 120 Brown St., Providence, R. I., at the age of 81 years. Mr. Dexter was born in Smithfield, R. I., in 1829 and was a well known cotton manufacturer. In 1898 he was appointed consul at Leeds, Eng. He had several sons, some of whom are now engaged in the cotton business.

Adolph Mack, treasurer of the Raritan Woolen Mills and the Somerset Mfg. Company of Raritan, N. J., died at his home in Somerville, December 25 at the age of 74 years. Mr. Mack was born in Murenberg, Germany, and came to this country when a young man. He was in business in Cincinnati, O., for a number of years and later engaged in the silk business in New York City. He was a successful business man and highly respected.

George Pearce, well known to the knitting trade as a builder of knitting machinery at 2316 No. 8th St., Philadelphia, died suddenly on December 29. The funeral will take place from his home, 249 No. 4th St., January 1.

James Kitchenman, a retired carpet manufacturer, died December 25 at his home, 1024 W. Lehigh Ave., Philadelphia, at the age of 84 years. He engaged in the dyeing business when he first came to this country from England, but afterwards entered into the manufacture of carpets and hosiery.

Harvey F. Hazling, overseer of the mule and frame spinning at the Cabot Mfg. Company, Brunswick, Me., died at a Portland hospital following an operation for a diseased bone in his head.

Hiram T. Cummings, a former resident of Paris, Me., died at Auburn, Me., where he had made his home with his son, Rev. Chas. S. Cummings. He was 92 years of age. He at one time was connected with his father in So. Paris, Me., in the manufacture of woolen goods.

Hobson Hobson died at his home in Windsor St., Ludlow, Mass., at the age of 81 years. He was born in Huddersfield, Yorkshire, Eng., and came to this country when a young man. He had charge of weaving for Wood & Merritt at Ludlow, Mass., and later for the Ludlow Mfg. Associates. He resigned his position some years ago on account of ill health.

Edward R. Phillips, secretary and treasurer of the Neuberger, Phillips Silk Company, Paterson, N. J., died at one o'clock, Jan. 17, at his home on 588 27th St. in that city. The deceased was born in Paterson thirty-two years ago and received his education from the public schools and graduated in the class of 1894. On graduating he entered the employ of Dexter & Lambert for the purpose of learning the silk business and eight years ago he became a member of the firm of Neuberger, Phillips Silk Company.

John A. J. Shultz, president of the Shultz Belting Company, also president of the Missouri Manufacturers' Association, died at his home, 4407 Washington Ave., St. Louis, Mo. Mr. Shultz fractured his foot recently while crossing the street in front of his home which caused embolism and this resulted in his death. He was 71 years of age and had been a resident of St. Louis for forty-five years. He is survived by five daughters and two sons.

James Welch died at his home in Dedham, Mass., Thursday, December 31st, at the age of 57 years. He had suffered from a shock which he received on the Sunday previous to his death, and this was the result. He was considered an expert wool examiner and had been associated with John G. Wright for over forty years.

Richard Cromwell, first vice-president of the Mt. Vernon and Woodbury Cotton Duck Company, died at his home in Baltimore, Md., January 1 at the age of 75 years. He had been connected with the above firm for many years and retired from active business a few years ago.

Joseph Milligan, a retired foreman, who was employed several years at the Saylesville Bleachery, Saylesville, R. I., died at his home on Chapel St., Lincoln, R. I., after a lingering illness caused by a complication of diseases at the age of 64 years.

Leedham Binns, president and founder of the Binns Patent Band Company, 1842 Germantown Ave., Philadelphia, died suddenly in the company's office from an attack of heart disease. He was born in Queensbury, Eng., in 1857, and in 1883 came to America and immediately entered into the manufacture of patent bands for textile machinery.

Joseph T. Paxton of the firm of Paxton & O'Neil, builders of knitting machinery at Philadelphia, died January 22 at Hotel Corcoran, Durham, N. C. Mr. Paxton was on a trip to Raleigh, N. C., for the purpose of installing machinery in the Durham Hosiery Mills and was taken suddenly ill at the hotel. Funeral services were held at his home, 331 Saunders Ave., Philadelphia, Tuesday, January 25, and interment at Laurel Hill Cemetery.

Charles P. Brown died at the Homeopathic Hospital, Philadelphia, from injuries he received in the woolen mill operated by his father, J. Morton Brown, being known as the David Brown & Sons Company. He met his death while experimenting at the factory. He was 22 years of age and a graduate of the Haverford College.

Joseph Edward Jenckes died on Jan. 6 at his home in Providence. Mr. Jenckes was prominently identified with textile manufacturing and other interests at Pawtucket and Providence. He was treasurer of the Jenckes Spinning Co. of Pawtucket, manufacturers of cotton yarns; he was president of the Jenckes Knitting Machine Co., builders of automatic knitting machines, president of the Tamerack Co., and president of the National Ring Traveler Co. Mr. Jenckes was born in Woonsocket, R. I., in 1851, and twenty years later engaged in business with his father under the firm name of E. Jenckes & Sons, manufacturing wire goods. The manufacture of ring travelers became part of their business, which was afterwards merged with the National Ring Traveler Co. Later on, the manufacture of cotton yarns was begun and a department for building knitting machinery was established. Some time ago the various branches of the business were organized into separate companies. Mr. Jenckes was a member of a number of business and social organizations in Providence and Pawtucket, including the Hope Club. He leaves a wife, two sons and a daughter.

Robert A. Haley died at his home, 29 Church St., Paterson, N. J., January 6, after a lingering illness. Mr. Haley, at one time, was a member of the firm of Healey & Haley, silk throwsters. He was 62 years of age and is survived by one sister, Miss Annie Haley.

Geo. Price, aged 50 years, died at his home on Main St., Hingham Centre, Mass. He was president of the Hingham Knitting Company and a director of the Cooperative Bank. He leaves a wife and one son.

John H. Whitten of Manchester, N. H., former agent of the Stark Mills, but later with the firm of Wellington, Sears & Company of Boston, Mass., died Jan. 4 from a severe attack of erysipelas.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Indigo and Its Competitors (der Indigo und seine Konkurrenten); by Dr. Fedor Felsen; Verlag fuer Textil-Industrie, Berlin, Germany; 75 pages, 8 1/2 by 11. Price $3.50.

This work deals with the competition between natural and artificial indigo. It is evidently based on a thorough knowledge of the chemical side of the question and is illustrated with numerous samples of dyed yarn and cloth before and after being subjected to various tests. The text is in German.

Sizing in all its Relations (Die Schlichterei in Ihrem Ganzen Umfange); by Carl Kretschmer; Verlag von A. Ziemsen, Wittenberg, Germany; 196 pages, 7 by 10. Price $3.50.

Owing to the importance of the subject it is to be regretted that this work has not been published in English. It deals with both the chemical and mechanical processes of sizing and is freely illustrated with excellent drawings and engravings. The text is in German.

Cotton Facts; Alfred B. Shepperson, Cotton Exchange Bldg., New York. Price $1.

We have received the December, 1909, edition of this well known hand book of the cotton trade, which has been brought up to date. Besides the regular statistical information it gives an excellent review of the cotton season for 1908-1909, an article on New York as a cotton market, a map showing the area infested by the boll weevil, and an article on the consumption of Egyptian and Peruvian cotton in the United States.

Textile Dictionary (Slovnik Textilni), German, Bohemian, English, French; by Prof. F. Berousek, Lomnitz, Bohemia; 542 pages, 10 1/2 by 7.

This dictionary contains about 20,000 technical German words used in the textile industry, with their equivalents in Bohemian, English and French. It is the first polyglot lexicon of textile and boilers, manufactured by this company. This the textile industry. Prof. Berousek has rendered a signal service to the industry in preparing the lexicon, which involved a vast amount of painstaking labor. We hope he will receive a reward commensurate with his deserts.

Recent Cotton Mill Construction and Engineering; by Joseph and Frank Nasmith; John Heywood, Ltd., Deansgate and Ridgefield, Manchester, England; 368 pages, 7 by 4 1/2. Price $2.50.

This book has entered upon its third edition, which is conclusive evidence of its value to the trade. The following abstract from the table of contents shows the scope of the work, which is freely illustrated: Constructional Details, Fire-Resisting Floors, Reinforced Concrete Building, Fire Appliances, Lighting, Heating, Ventilating and Humidity, Calculations of Machines in Mills, Steam Boilers, Turbines, Gas and Oil Engines, Rope Driving, Shafting and Bearings.

Bundle-Weights of Thrown Silk; 22 pages, 9 by 6; Haledon Throwing Co., Paterson, N. J.

This pamphlet contains tables such as are required by silk throwsters and their customers. Each of the tables is based on a given number of yards and the weights are given in drams, pounds and ounces, with the corresponding sizes in deniers. There is a table showing the number of skeins of tram of various sizes and lengths per 100 pounds of raw silk. A table showing the increase in weight of thrown silk corresponding to the increased rate of boil-off is included in the pamphlet, which contains other useful information.

Business Literature.

Phoenix, a Journal Devoted to Belt Engineering; The New York Leather Belting Co., 51 Beekman St., New York.

This publication is devoted exclusively to the subjects of belting and transmission of power and should be placed within reach of every power user. It contains many valuable articles on these subjects, those in the issue of January 15 being as follows: Blind Theory and Open-Eyed Practice as Applied to Belting; Boston's Big Manufacturers Experiment with Victor-Balata; A Five-Year Record in a Hat Factory; A Salesman's Meeting with a Unique Object; Virginia Belt Problems and How Solved; Some Opinions of a Consulting Engineer. There is also a question and answer department in which problems relating to belting and power transmission are answered by the publishers.

The Lighting of Mills and Factories: Holophane Company, Newark, Ohio.

This booklet of 32 pages bound in a specially designed cover comprehensively treats of different kinds of lighting in mills and factories, showing the utility and economy of good lighting systems and of the Holophane reflectors. There are several effective "before and after" illustrations showing in a unique way the benefits derived from the proper application of the Holophane-D'Olier system as used on warpers and looms.

Westinghouse Diary for 1910; The Westinghouse Electric Co., Pittsburg, Pa.

A very attractive leather bound diary for 1910 which embodies many new features over previous diaries issued by this company. It gives the population of leading cities, area and population of States and Territories, representative hotels in leading cities, domestic and foreign postage, interest laws and statutes of limitations.

Mason Ring Spinning; Mason Machine Works, Taunton, Mass.

A catalogue devoted especially to a new spinning frame added to the line of cotton machinery manufactured by the Mason Machine Works which, as is stated in an introductory note, was founded by Mr. William Mason about 80 years ago. Besides clearly and accurately illustrating the spinning frame and its parts, and giving a de-

tailed description of them, the catalogue contains the following valuable and useful tables: Twist Table, Production Table, Breaking Strength of Yarns, Travelers' Table, and others.

Murray Corliss Engines; Murray Iron Works Co., Burlington, Ia.

A large general catalogue, No. 65, on engines and boilers, manufactured by this company. This is exceptionally beautiful and well gotten up, printed in three colors throughout. The cover is embossed in gold and black and has a very attractive center design giving a handsome colored photographic reproduction of an engine. The catalogue illustrates with fine half-tone cuts various parts of the Murray Corliss Engines, Compressors, Boilers and Feed Water Heaters. There are also three fine blue prints showing a plan for a power plant.

Sturtevant Fuel Economizers and Air Heaters, Catalogue No. 150; B. F. Sturtevant Co., Hyde Park, Mass.

An illustrated catalogue describing the economizers and air heaters built by the B. F. Sturtevant Co. It contains a description of the Sturtevant new high-pressure type economizers. This type of economizer, with all joints metal-to-metal, will stand working pressures up to 300 pounds per square inch, and the doing away with gasket joints in this design, eliminates chance of leakage. The Sturtevant positive-scraper mechanism is designed to prevent the scrapers from sticking or binding. This eliminates one of the troubles found in earlier designs of economizers.

As this catalogue shows not only the design and gives dimensions of the economizer, but also shows examples of the investment returns on an economizer, it will be found of interest to engineers, managers and owners.

Dry Kilns for Timber Products; The American Blower Co., Detroit, Mich.

The latest edition of the dry kiln catalogue contains much that will be of interest to every manufacturer of wood products. It describes and illustrates the drying and preserving of lumber by the use of the "A B C" moist dry kiln.

Calendars.

The Arguto Oilless Bearing Co., Wayne Junction, Pa., are sending out an attractive wall calendar which shows by illustration and plain text not only the days of the month but the many varied uses of the Arguto oilless bearing in mechanical and textile fields.

George S. Wood & Co., 620 Atlantic Ave., Boston, Mass., dealers in wool, noils, etc., are sending out to the trade a very handsome calendar on which is a raised picture of a number of sheep, and entitled "All Wool."

Elmer H. King, 200 Summer St., Boston, Mass., dealer in worsted yarns, is sending out to the trade a very pretty calendar for office use entitled "The Girl from the Golden West."

R. H. Hood Co., Philadelphia, Pa., dealers in oak tan belting and mill supplies.

A large wall calendar on which is reproduced by color photography a beautiful scene entitled "A Glimpse of the Sound from Montauk." Montauk Point is situated at the eastern extremity of Long Island, about as picturesque a spot as can be found in the East.

Large Filter Plants Installed.

The American Water Softener Co. of Philadelphia reports the successful installation of some large filter plants in different parts of the country, including one just completed for J. B. Duke, Esq., at his farm in Somerville, N. J., which has a capacity of ten million gallons per day and is probably the largest pressure filter installation in the world.

Filter plants have been installed for many concerns in the textile trade including the following: 1,000,000 gallons capacity for Patchogue Manufacturing Co., Patchogue, Long Island, N. Y.; 250,000 gallons for William Grundy & Co., Bristol, Pa.; 250,000 gallons for Sibley Manufacturing Co., Augusta, Ga.; 200,000 gallons for International Manufacturing Co., New York City; 2,000,000 gallons for Joseph Bancroft Sons Co., Wilmington, Del., and a 5,000 gallons per hour water softener for the Coosa Manufacturing Co., Piedmont, Ala.; 8,000 gallons per hour softener for American Tread Co., Fall River, Mass.

Removal Notice.

Mr. Charles T. Main announces that on account of the growth of business he has been obliged to move into more commodious offices, rooms 817-833 of the new Boston Safe Deposit and Trust Co. Bldg. Here he will be better prepared to conduct work in the following branches of engineering: Textile mills and other industrial plants, water power and steam power development, examination and reports on plants with reference to their value, reorganization or development.

Mercerizing, Bleaching and Dyeing.

The Globe Yarn Company has succeeded to the business of the Wyoming Yarn Co., 623-29 Prospect Ave., Scranton, Pa., where the new owners, Wm. H. Schaefer, treasurer, and George H. Craven, general manager, are mercerizing, bleaching, dyeing and coning cotton cloth. They are also making a specialty of dyeing silk hosiery, pure dye, weighted and skein silks. The company, which is well known, reports that their plant is taxed to its utmost capacity in an effort to fill orders. They have a large business with hosiery manufacturers for the dyeing of silk hosiery, for which the works are specially equipped.

The Samoset Co., Valley Falls, R. I., have placed an order for humidifiers with the American Moistening Co., Boston, Mass.

Barnard Mfg. Co., Fall River, Mass., have placed a repeat order for humidifiers with the American Moistening Co., Boston, Mass.

Knitting Mill Specialties.

Joseph A. Firschman of Utica, N. Y., is well and favorably known among the knit goods manufacturers. On account of his rapidly increasing business, he has been compelled to take considerably more space and has arranged to occupy the top floor of the building which he now occupies. This will give him an additional space of 100 by 50 feet, enabling him to increase his product materially. The top floor is well lighted, equipped with the latest improved work benches and machinery, and is connected with the other floors by a large power elevator.

The first floor of the building contains the general offices, the private office and a demonstrating room where Mr. Firschman will be able to show his line of machinery in operation to prospective customers. He numbers among his customers many representative concerns in the knitting industry throughout the United States and Canada and has shipped some machinery to England.

The line includes embossing machines, cloth-cutting machines, cloth-turning machines, collarette-cutting and winding machines, electrically heated neck-marking machines, cuff-cutting machines, button-hole spacers, derricks, lace-measuring clocks, adjustable vertical drying machines, horizontal drying machines and hydro-extractor covers. On a recent visit our representative found the works very busy with a number of substantial orders booked. Mr. Firschman will be pleased to send circulars and full information regarding any machine that he makes in which prospective customers are interested. We take much pleasure in recommending his product to the trade at large.

Removal Notice.

William L. Puffer informs the trade that after February 1, 1910, he will be in his new offices in the Boston Safe Deposit and Trust Company Bldg., 201 Devonshire St., rooms 801-802, where he will continue to transact a consulting and expert electrical engineering business in all of its branches.

Fibre and Fabric Changes Hands.

Frederick L. Babcock, formerly managing editor of the Wool and Cotton Reporter, has assumed control of Fibre and Fabric. Associated with him are Edward M. Hecker, who will be the New York manager, Edith L. Hodge, treasurer and managing editor, and Geo. E. Hayes, all recently with the Wool and Cotton Reporter. We understand that O. B. Munroe, formerly editor of Fibre and Fabric, returns to his old connection with the Reporter. The new management promises a progressive campaign and they have our best wishes for their success.

Danielson Cotton Mills, Danielson, Conn., have placed a repeat order with the American Moistening Co. for humidifiers.

Chinese Woolen Factories.

Consul Augustus E. Ingram sends from Bradford the following extract from a report by the British commercial attache in Peking on the establishment of two woolen factories in China:

"A new move is about to be made in the introduction of woolen clothing for the modern drilled army of China, and this may possibly prove the first step toward the more general adoption of woolen clothing throughout the country, a result which followed the same action in Japan. Unfortunately for the British manufacturer, there are indications that China means to supply her own demands in this respect. Two Chinese woolen factories have been recently established, which will deal with the requirements of the army board for woolen clothing. One is at Shanghai, a large building fitted with up-to-date Belgian machinery and employing at present several Belgian operatives to teach the Chinese students. I am told that this factory is capable of turning out sufficient clothing for 1,000,000 men. The other was established in 1908 at Chingho, about six miles from Peking. It is well equipped with British machinery and employs three or four British operatives. If the Civilians of China show any inclination to follow the lead of the army in wearing wool, there is little doubt that the number of such factories will increase. It is perhaps too early to predict an opening in this connection for Bradford tops, but it must be remembered that a demand for tops followed close on the establishment of woolen manufactories in Japan."

Robb-Mumford Boiler Co.

William H. Walker has been appointed sales manager for the Robb-Mumford Boiler Co., with headquarters at 923-924 Board of Trade Bldg., 131 State St. Harry V. Brady, who has had charge of the Robb-Mumford shops for the past year and a half, has been appointed superintendent of the works at South Framingham, Mass. D. W. Robb is the general manager of the company.

Busy on Full Automatics.

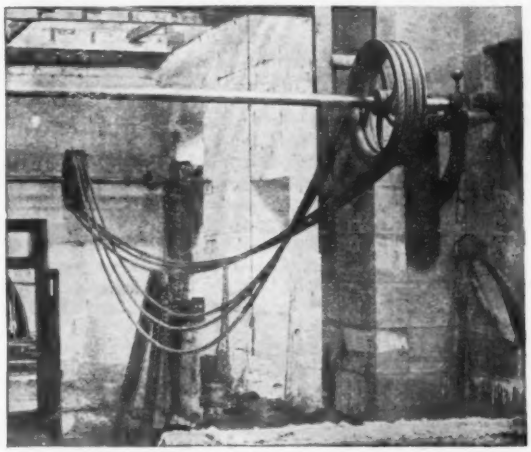
The Boss Knitting Machine Works of Reading, Pa., are very busy on full automatics and 15/16ths automatic knitters, having more business than they can handle at the present time.

The Potter & Johnston Co., at Pawtucket, R. I., have completed the installation of their picking machinery at the Hadley plant of the American Thread Company's mill. This equipment consists of two beater breakers with double hopper feeders and single beater finishers. The quality of the work done as regards cleaning, evening, etc., is such that any mill contemplating the purchase of picking machinery will find it well worth their while to see and examine these machines and results themselves.

Victor Mfg. Co., Greers, S. C., have placed a repeat order for humidifiers with the American Moistening Co., Boston, Mass.

An Australian Rope Drive.

The rope drive installed in the Paramatta Woolen Mills, Sydney, N. S. W., as shown in the picture, is rather odd in several ways. The three ropes are independent of each other, English system, and have stretched to such lengths that their slack parts sag far below and run in between the driving halves. The ropes run well in spite of contact with each other, and although such an arrangement may not be considered good practice, the extreme sag is beneficial to the extent that it



AN AUSTRALIAN ROPE DRIVE.

materially increases the arcs of pulley contact.

In spite of the stretch of ropes to unequal lengths, each assumes about an equal portion of the load, as shown by the similarity of the curves of the driving halves. These ropes, with this equal distribution of the load were treated with Cling-Surface, made by the Cling-Surface Co., of Buffalo, N. Y., to prevent surface slip and to preserve the interior of all kinds of driving ropes and belting. This drive demonstrates that ropes working on the English system, if properly treated, can be made to deliver maximum power without regard to their looseness, and that the constantly increasing length due to stretch need not effect the distribution of the load among the individual ropes. Under these conditions, resplicing is seldom necessary.

It might be added that a reliable anti-slip and preservative treatment, aside from the benefit to the ropes, is also desirable when the ropes are arranged to drive by the American system. In this instance the tighter grip of each strand on the pulley sheaves permits of a reduced initial tension on the drive, and consequently less weight is necesssary on the tighteners.

Grant Yarn Co., of Fitchburg, Mass., have placed a repeat order with the American Moistening Co. for humidifiers.

Change of Name.

For the purpose of more closely identifying the name of their company with their product the Mayo Knitting Machine and Needle Co. have decided to change their name to the Acme Knitting Machine and Needle Co., Franklin, N. H. "Acme" seamless hosiery knitters are their principal product and it seems only natural that the name of the company should distinctly identify its product. They wish it to be kept uppermost in the minds of all users of seamless hosiery knitters that they build the "Acme" knitter and that this machine is separate and distinct from any other similar machine that is built.

Turbo-Humidifying Installations.

The first order for any new apparatus is usually given in the nature of a trial. A second order indicates approval and a third and more extensive order after several years experience would seem to indicate complete satisfaction.

That is the story of the installation of the Turbo-Humidifier at the mills of the Parkhill Mfg. Co. at Fitchburg, Mass. Fitchburg, by the way, is also the headquarters of the G. M. Parks Co., manufacturers of the "Turbo." This last order is for the complete equipment of the new Russell Mills of the Parkhill and calls for 208 heads. They are to put in a large steam driven compressor in connection with the present power plant. The exhaust steam from this compressor will supplement their present hot-water heating equipment, so that it is cheaper from a power standpoint to install this compressor than any other form, because of the fact that the new mill will be electrically driven and will have no power from which exhaust steam can be transformed into heating work. In this new equipment there will also be included the attachment for air cleaning which is so to speak, a "by-product" of the Turbo system.

Among other recent orders for Turbo installations is a second order from the Champlain Silk Mills of Brooklyn, N. Y., and orders from the Pepperell Mfg. Co., Biddeford, Me.; Fletcher Mfg. Co., Providence, R. I.; Cleghorn Cotton Mills, Rutherfordton, N. C.; Cedar Falls Cotton Mills, Cedar Falls, N. C.; Newberry Cotton Mills, Newberry, S. C.; Marion Cotton Mills, Marion, N. C.; Martinsville Cotton Mills, Martinsville, Va.; Perkins Hosiery Mills, Columbus, Ga.; Clinton Cotton Mills, Clinton, S. C.; Verlina Mills, Jacksonville, Ala., and the Durham Hosiery Mills, Durham, N. C.

Bellicosa.

The attention of bleachers is called to the new Bellicosa softener brought out by the Arabol Mfg. Co., 100 Williams St., New York. They claim that two and a half pounds of Bellicosa will equal twenty-five pounds of ordinary finishing paste. It is very easily handled, another advantage, which, besides its cheapness, will help to introduce it.

Asbestos Mine Owners and Manufacturers Form Association.

The International Asbestos Association was recently organized at a meeting held in New York. Its membership is composed of representatives of American and Canadian mine owners and manufacturers. The interests at the meeting represented between 80 and 90 per cent. of the asbestos business in the United States and Canada. Included in the association are the largest producers and users of asbestos in the United States and Canada, among them the Amalgamated Asbestos Corporation, Limited, Keasbey & Mattison Co., Philip Carey Mfg. Co., Asbestos Protected Metal Co., Franklin Mfg. Co., H. W. Johns-Manville Co., Sall Mt. Asbestos Mfg. Co., Ling Asbestos Co., and the United States Asbestos Co. The aggregate capitalization of the concerns who are so far represented is over $40,000,000. The following were elected officers of the Association: T. F. Manville, president; R. V. Mattison, Jr., vice-president; R. P. Doucet, secretary.

It is announced that the purposes of the association are the general exploitation of the uses of asbestos, particularly in the field of fireproof construction, cooperation between consumer and producer, cultivation of new markets, and development of processes whereby the wastes in the industry may be rendered commercially valuable. The association will establish a bureau that will be devoted to the aforementioned purposes.

One of the important factors in the association is the so-called Canadian "asbestos trust"—the Amalgamated Asbestos Corporation, Limited—a combination of several of the most important Quebec asbestos properties located at Black Lake and Thetford, and which controls 80 per cent. of the output of these districts. The greater part of the world's supply of asbestos comes from the Black Lake and Thetford districts. Among the directors of the corporation are Hugh A. Allan of the Allan Line Steamship Co., ex-assistant Attorney-general James M. Beck, Harry A. Berwind of the Berwind-White Coal Mining Co., Geo. D. Crabbs of the Philip Carey Mfg. Co., E. B. Greenshields of Montreal, Robert Mackay of the Canadian-Pacific Railway, H. H. Melville of the Canadian-Northern-Quebec Railway, R. V. Mattison, president of the Keasbey & Mattison Co., and H. E. Mitchell of the Philadelphia banking firm of Cramp, Mitchell & Shober.

Asbestos is produced in Canada, Russia, the United States, Cape Colony, and the island of Cyprus. It is stated that the Canadian asbestos supply is practically inexhaustible and that it is the chief factor in the control of the asbestos industry of the United States and, in a marked degree, of the world.

Potter & Johnston Machine Co.

H. G. McKerrow Co., Ltd., 88 Broad St., Boston, Mass., have been appointed New England representatives of the Potter & Johnston Machine Co., Pawtucket, R. I., builders of cotton opening and picking machinery. O. A. Robbins is Southern representative of the company.

Technical Publicity Association.

This was another open meeting. Secretary H. H. Kress presided and announced at the outset the growing condition of the Association and the enormous work to be taken up. C. R. Lippmann, advertising manager of the Genuine Bangor Slate Co., Easton, Pa., suggested methods whereby members collectively could gather a vast amount of advertising and merchandising information. He also suggested the desirability of interesting the heads of firms more actively in advertising and its fullest importance, that employers, sales managers and salesmen did not take proper interest in advertising. He suggested an employers' evening, when the members bring the managing officers of their sales departments.

Geo. W. Wharton, advertising manager for Jos. P. Day, real estate operator, disclosed some interesting information of the press bureaus and press agents in influencing public opinion. H. Tipper, advertising manager of The Texas Co., told of the curious advertising situation in the merchandising of their product involving the factors of municipal engineers, councilmen, mayors, contractors and oftentimes property owners who are generally assessed for new pavements, and other curious problems which he handled principally through direct advertising.

H. M. Horr, advertising manager of The Oakland Chemical Co., spoke about direct mail advertising and the benefits of circularizing by form letters. He pointed out that by far the greatest percentage of form letters sent out is surprisingly ineffective and proved his claim with an exhibit of some of the worst. Some of these added greatly to the hilarity of the occasion. Mr. Horr also stated that direct advertising has no conflict with trade paper advertising, but deserved a place in almost every well regulated advertising campaign.

Barrett Smith, advertising manager of the Stone & Webster Engineering Corporation, Boston, then registered a few protests of the unprofessional things in advertising practice as seen by one of professional training in another field; talking straight from the shoulder" about some sore spots and offering suggestions for the solution of some defects.

Subsequently an energetic discussion on the uniform advertising contract proposed by the committee held the meeting till quite late. The proposed contract will again come up for final action at the next meeting.

Opens Southern Office.

The Woonsocket Machine & Press Co., Woonsocket, R. I., the largest manufacturers of cotton roving machinery in the United States, will be represented after March 1, 1910, by J. H. Mayes, with offices at 1112 Realty Bldg., Charlotte, N. C. Mr. Mayes is widely known throughout the South.

*Wisconsin, Two Rivers. Twenty-five to 50 knitting machines will be installed in the space leased by the M. Friedlander Knitting Co. of Milwaukee for a branch plant, and if they are successful in getting enough good help this number will be greatly increased.

A Dark Prospect.

The outlook in the Lancashire cotton industry gets darker and darker. All through this year and last a depressed feeling has prevailed. Trade has been slack and dragging. The production has been large owing to the great loom and spindle increase, though short time and strikes have lessened the output of yarn and piece goods. It has been a trying time for all engaged in weaving and spinning, whether masters or men. This year has indeed been worse to all concerned than the twelve months ending last December.

Raw cotton values have been on a high level, and as 1909 draws to a close, prices are abnormally dear, and at the highest point of the year. Yarn and cloth quotations also are quite out of the reach of home buyers and shipping merchants. Business today is practically at a standstill, for exporters of cloth are receiving no encouragement from our foreign outlets to operate.

To show the state of the weaving trade it is estimated that this week 25 per cent. of the machinery is stopped in the leading manufacturing centers of Blackburn and Burnley. Employment in the mills and sheds is at its lowest. In weaving alone it is safe to say that upwards of 10,000 persons are actually out of work, and that the great majority of spinners and cardroom hands are running about half-time. It may be stated here that in the simple process of cotton-weaving in Lancashire 275,000 operatives are engaged, and in spinning 150,000. To these figures must be added numerous smaller trades dependent on cotton. Then, to indicate the year's bad trade, it may be reported that the table I have compiled of the stocktakings of 82 purely spinning concerns for 1909 shows a loss of $1,165,928. This working out at a loss on paid-up share capital ($15,066,204) of 7.73 per cent. per annum, while on share capital and loans ($1,165,928) combined after paying interest on loans the loss is 5.57 per cent. per annum. The average loss per company is $14,215. In 1908 the profit was 15.18 per cent. per annum, while in 1907 the profit rate was 33.86 per cent. per annum. The total spindlage in the 82 mills is 6,978,576, employing 18,000 operatives.

One of the chief reasons—probably the chief—of the current depressed state of affairs is the raw cotton situation. There is the question of overproduction by the factories, which at the beginning of 1909 was a marked factor. Undoubtedly the increase of about 100,000 looms as compared with four years ago has told its tale. In the boom years our cloth shipments were on an unexampled scale. In 1906 the total yardage exported was 6,260,771,400, and the year later 6,297,707,900. In 1908, however, a great falling off occurred, viz, 5,532,413,200 yards, and this year of 1909 the figures will be again small, my estimate being a little below 1908. The markets abroad are gradually being depleted, and old stocks are slowly being liquidated. . . .

It need hardly be said that Lancashire is greatly concerned at the raw material outlook, not only in American cotton, but also as to Egyptian kinds. In the latter style of long-stapled qualities we are face to face with a small crop, and consequently high rates. Last season the yield was about 6,700,000 cantars, and latest advices talk of not more than $5,250,000. Some authorities say, indeed, that the output will only be 5,000,000 cantars. Prices have here risen smartly. In F.G.F. brown the spot rate in March last year was 7 7/8d. On Saturday the figure was 73 per cent. higher! A feature of interest is that during the past few years the consumption of Egyptian cotton has largely increased, not only in this country but on the Continent.

If the American crop be only, say, 11,000,000 bales and the Egyptian yield 5,250,000 cantars, it means prolonged short time and a partial stoppage of machinery during the whole course of the season ending August next. This year has been very bad to employers, and also to the workpeople, and the prospects of 1910 are bad.—London Daily Mail.

Mr. F. A. Hall, who for the past twelve years has been Manager of the Chain Block & Hoist Dept. of the Yale & Towne Mfg. Co., whose General Offices are at Nos. 9-13 Murray St., New York, and whose Works are at Stamford, Conn., has resigned his position in order to accept election as Vice-President and Treasurer of the Cameron Engineering Co. of Brooklyn, N. Y.

Mr. Hall's successor will be Mr. R. T. Hodgkins, who for several years has been his chief assistant, and who is thoroughly qualified by experience and ability successfully to perform the duties of the position.

In his new connection Mr. Hall expects to make a specialty of trolleys and appliances for overhead handling of materials, and in connection therewith, to make use of the Yale & Towne Blocks and Hoists, with the sale of which he has so long and prominently been identified.

New Full Fashioned Machine Agency.

The full fashioned hosiery machines built by H. Alben Ludwig of Chemnitz, Saxony, are well and favorably known throughout the hosiery trade. American manufacturers will now be able to deal directly with a representative in this country. An office has been opened in the Wool Exchange Bldg., 260 West Broadway, New York, and Mr. Louis Hirch will act as sole American agent for the United States.

Ludwig machines have a high reputation and combine a number of different patented devices for improvement of quality and quantity of production. The feature of doing away with the necessity of dampening the thread in making both cotton and silk stockings, as is usually done on other machines, is an attractive feature to knitters. There are many others.

Mr. Hirch has been connected with the full fashioned hosiery business in this country as a practical man for many years. From the standpoint of the user of full fashioned machinery, he knows the points of importance and is able to practically demonstrate and help his customers in the installation of machinery.

Recent Textile Patents.

COMBING MACHINE for Cotton Fibers. 947,070. Percy E. Willis, Southport, and James Jully, Bolton, Eng.

FABRIC. Machine for Making Composite. 945,635. Ernest Strauss and Wm. B. Erskine, New York.

FABRICS. Apparatus for the Production of Leno. 946,137. Joseph Kind, Keighley, Eng.

KNITTING MACHINE. 944,968. Carlton J. Mumford, Amsterdam, N. Y.

KNITTING MACHINE. 946,854. John C. Duemler, South Bethlehem, Pa.

KNITTING MACHINE Stop Motion. 944,921. Bernard T. Steber, Utica, N. Y.

LOOM. Circular. 944,421. Robert E. Evenden, Manchester, Eng.

LOOM CONNECTING Rod and Lubricating Device. 945,841. William P. Evans, Manchester, Eng.

LOOM TAKE-UP Mechanism. 944,578. Alonzo E. Rhoades, Hopedale, Mass.

LOOMS. Cutting Attachment for. 944,947. Paul Clemens and Gustav H. Repert, Scranton, Pa.

LOOMS. Lay for Narrow Ware. 946,295. William Wattie, Worcester, Mass.

LOOMS. Pick Finder Device for. 945,722. Simeon S. Jackson, Readville, Mass.

LOOMS. Smash Preventor for. 947,003. William Lonzo, Fitchburg, Mass.

LOOM. Ribbon. 944,610. Arnold Handschin, Basel, Switzerland.

SHUTTLE. 944,855. Philippe Gauthier, Lowell, Mass.

SPINNING ARTIFICIAL Threads and the Like. Producing Solutions for. 945,559. Rudolf Linkmeyer, Bremen, Germany.

SPINNING DEVICE. 945,934. Willis B. Gilmore, Idaho Springs, Col.

SPINNING MACHINE. 946,203. Frederick S. Culver, Taunton, Mass.

SPINNING and Twisting Rings. Holding Means for. 945,805. Albert C. Rhoades, Hopedale, Mass.

SEWING and Embroidering Machine. 944,599. Robert Cornely, Paris, France.

SPINNING RINGS. Means for Retaining and Delivering Travelers for. 945,907. Louis S. Burbank, Hopedale, Mass.

THREADS off Tulle, lace, embroidery, and the Like. Apparatus for Cutting or Shaving. 946,904. Oscar C. Levray, Calais, France.

THREADS. Lustering Silk. 947,027. Edward Pohl, New York.

YARN REEL for Reeling Machines and Winding Machines. 944,987. Jean Schweiter, Horgen, Switzerland.

YARN TENSION Device. Chain. 946,359. David Lowe, Fitchburg, Mass.

Recent Textile Trade Marks Registered.

"Block House Brand." Outershirts. Pittsburg Knitting Co., Pittsburg, Pa.

"Sunshine." Ladies' and Misses' Outer Suits. The Sunshine Coat & Suit Co., Cleveland, O.

"Belmar." Undershirts, Drawers, etc. Theodore F. Baulig, Egg Harbor, N. J.

"Gilt Edge." Hosiery. Carson, Pirie, Scott & Co., Chicago, Ill.

"Silotta." Petticoats. National Cloak & Suit Co., New York.

"Duquesne." Wool Blankets. The Pittsburg Dry Goods Co., Pittsburg, Pa.

"Fort Pitt." Wool Blankets. The Pittsburg Dry Goods Co., Pittsburg, Pa.

"Presto." Coats and Coat Collars. Morris Koppelman, New York.

"Show Girl." Hosiery. Chas. Chipman's Sons, Easton, Pa.

"Golden Rod." Hosiery. Chas. Chipman's Sons, Easton, Pa.

"Martha Washington." Hosiery. Chas. Chipman's Sons, Easton, Pa.

"Marathon." Piece Goods Composed of Cotton, Flax, Silk, Wool, etc. R. B. MacLea Co., New York.

"Metropolitan." Silk Ribbons. J. W. Streetor Co., New York.

"Mary Ann." Aprons, Waists, Skirts, etc. Chas. M. Gregory, Denver, Col.

"School Days." Hosiery. Chas. Chipman's Sons, Easton, Pa.

"Ipswich." Hosiery. Ipswich Mills, Boston, Mass.

"LeMar." Cravats, Ties and Bows. Levy & Marcus, New York.

"Marjorie." Hosiery. Marshall, Field & Co., Chicago, Ill.

"Emperor." Hosiery. Marshall Field & Co., Chicago, Ill.

"Henrietta." Hosiery. Marshall Field & Co., Chicago, Ill.

"Admiral." Hosiery. Marshall Field & Co., Chicago, Ill.

"Minereva." Hosiery. Marshall Field & Co., Chicago, Ill.

"Portia." Hosiery. Marshall Field & Co., Chicago, Ill.

"Alain." Petticoats. Wm. H. Allen, Detroit, Mich.

"Athenia." Knit underwear. Athens Knitting Co., Athens, N. Y.

"Idealean." White, printed and dyed textile fabrics of cotton, wool and silk. Arnold Print Works, North Adams, Mass.

"Marathon." Hosiery. A. E. Nettleton Co., Syracuse, N. Y.

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*Michigan, Saginaw. An increase has been made in the capital stock of the Clare Knitting Mills Co. from $15,000 to $50,000. The plant was recently moved from Clare to Saginaw, where a larger mill has been built.

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